South African Medical Journal
Suid-Afrikaanse Tydskrif vir Geneeskunde
P.O. Box 643, Cape Town Posbus 643, Kaapstad

e Town, 7 January 1956 Weekly 2s. 6d. | Vol. 30 No. 1 | Kaapstad, 7 Januarie 1956 Weekliks 2s. 6d.

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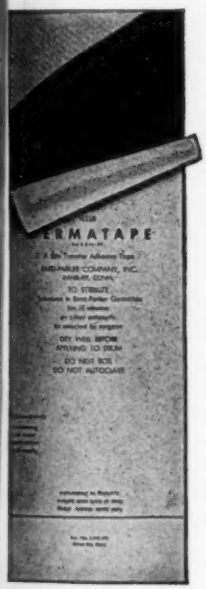

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P.O. Box 643, Cape Town Posbus 643, Kaapstad

Cape Town, 7 January 1956 Vol. 30 No. 1 Kaapstad, 7 Januarie 1956
Weekly 2s. 6d. Weekliks 2s. 6d.

EFOCAINE IN THE CONTROL OF PAIN FOLLOWING THORACOTOMY

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In April 1952 Iason and Shaftel[1] published a report on the use of a new prolonged local anaesthetic agent, Efocaine. It is a solution containing as its active ingredients procaine and butyl para-aminobenzoate, both of which are insoluble in water, dissolved in an aqueous-miscible organic solvent, propylene glycol. The solution is made up at saturation limits so that, on contact with the tissue fluids, the anaesthetic bases are immediately precipitated. The water-miscible solvent is rapidly absorbed, leaving the crystalline anaesthetic agents to exert a prolonged action at the site of injection.

In this and a further report[2] the authors describe the use of efocaine to control the pain following surgical operations in various parts of the body; their series covers 584 cases and they claim a dramatic relief of post-operative pain. Other reports[3-17] have since been published on the use of efocaine for the same purpose after operations covering most portions of the body from the tonsil to the ano-rectal region. Four of these[14-17] describe the use of efocaine injected under direct vision into the intercostal nerves at the end of a thoracotomy or thoracoplasty, with marked relief of pain in up to 80% of cases.

The present report deals with the use of efocaine to relieve the pain following operations on the chest. The technique as described by Boere[16] was adopted, and efocaine was injected at the close of operation under direct vision into 1 or 2 intercostal nerves above the rib through which the chest was opened, and 2 or 3 nerves below, 1 c.c. being injected into each nerve. It was soon found that, for the purpose of evaluating post-operative pain, thoracoplasties were of no use, for a patient undergoing a 3-stage thoracoplasty often has very much less pain with one of the stages than with the other two, even without efocaine. A striking example of this was the patient (who had not had efocaine) who was so remarkably free of pain after a 2nd-stage thoracoplasty as compared to his 1st stage, that he was firmly convinced he had received the 'new wonder drug' he had read about in the Sunday papers. It was therefore decided to confine this investigation to thoracotomies.

The cases to receive efocaine were chosen completely at random during a 4-month period, and were compared with other cases in the same period. Neither the patients, the nursing staff of the post-operative ward, nor the physiotherapists, knew which cases had been injected, the only people knowing this being the surgeon who had done the actual operation, and the author.

Table I shows the distribution of cases in the two groups, whilst Tables II and III show the age and weight distributions respectively. From these it can be seen that the two groups are as completely comparable as can be expected from a purely random method of selection.

CLINICAL IMPRESSIONS

Those patients who had received efocaine were found to be more comfortable than the patients in the control series; they moved more freely in bed and coughed more strongly with very little pain. The difference was especially noticeable in the taking of the routine portable X-rays on the evening of operation. The efocaine patients were able to sit up easily, often without help, whilst in the control group most patients required almost constant help and support.

The patients' own comments, in response to (it is hoped) indirect questioning about pain, also illustrate the difference, as can be seen from Table IV. The figures in the control group, while significantly different, nevertheless serve to stress the extreme difficulty of evaluating pain clinically, as many as 29% of cases stating that they were free of pain.

The post-operative staff and the ward nursing staff confirmed these impressions, a typical (and frequently repeated) comment in the efocaine series being, 'I have never nursed a patient who has done so well'.

Though the physiotherapists were not told which cases had been given efocaine, they soon became proficient in picking out the cases in each group, judging by the patients' ability and willingness to breathe, cough and move around. Table V summarizes their report, and

shows, for example, that in the efocaine group they correctly identified 74% of the patients who had been injected. The high percentage of error in the control series (40%) again illustrates how misleading a clinical evaluation of pain can be.

OBJECTIVE RESULTS

1. Post-Operative Analgesics

The relief of pain, by whatever method, is an extremely difficult thing to evaluate objectively. The method used in previous reports on efocaine has been to total the post-operative drugs given to relieve pain, and this method was adopted in this series. The only instructions to the nursing staff were to give analgesics only when necessary and not, as is sometimes the practice, to give them as a routine before turning or 'coughing' a case. The drugs given after the 3rd day were not included, as most thoracotomies are relatively free from pain by this time.

Table VI shows the total dosage of each of the 3 analgesics used for the relief of pain, the number of cases in which each was used, the dose per case and the dose per stone. It can be seen that in every comparison, apart from Mist. Veganin in the first 24 hours, the dosage used in the efocaine series was considerably less than in the control group. Table VI also shows the results of a statistical analysis of these figures, which reveals that, again apart from Mist. Veganin, the difference in the 2 groups is significant, especially in the first 48 hours—the lesser significance of the dosage for the whole 72 hours bears out the clinical finding that even in the control group the patients had much less pain by the 3rd day.

2. *Post-Operative Complications*

The main aim in the immediate post-operative treatment of a thoracotomy is to obtain adequate expansion of both lungs and, were the patient to be completely free of pain and without the respiratory depression and drowsiness which often accompanies centrally-acting analgesics, one would expect the incidence of complications such as atelectasis, to be much less. Table VII which shows the incidence of post-operative troubles in the 2 groups; reveals no such effect, it shows a similar incidence of collapse, in each group with a somewhat higher incidence in the control group of persistence of air or fluid in the pleural cavity. No statistical significance however is to be attached to the difference in the figures for the two series, owing to the small number of cases.

3. *Side-Effects*

In only one case were any untoward side-effects noticed, but these were so serious as to deserve a full description.

The patient was a female aged 26 and weighing 9 stone, who had a thoracotomy for resection of the right upper lobe and apex of the lower lobe. At the end of the operation, 1 c.c. of efocaine was injected into each of the 3rd, 4th, 5th, 7th and 8th intercostal nerves in the usual manner under direct vision.

On the morning after operation, the patient complained of paraesthesiae of both legs with weakness, and she was unable to pass urine. On examination it was found that muscular power was weaker on the right side and that the right knee-jerk was absent. Both ankle-jerks were present and both toes down-going. After the injection of Carbachol urine was passed but on the following and the 3rd day the patient had to be catheterized because Carbachol no longer had any effect, and she still complained of numbness and weakness of the legs.

By the 5th post-operative day sensation and pain were beginning to return to the legs, but she did not begin to pass urine spontaneously until the 7th day. By the 10th day it was noted that the legs were improving in every way, although she still complained of some loss of control of the right leg. The movements at the knee and ankle joints were weaker on the right side, where sensation to cotton-wool and pin-prick was blunter and position sense was impaired.

By the 16th day the right leg, though still a little weak, was recovering. Progress was steady although rather slow and 3 months after operation she was ambulatory but still required some re-education to correct the use of her right leg. When last seen 5 months after operation, there was no apparent difference in power between the two legs. She has not attended for follow-up since then.

DISCUSSION

Clinical impressions were extremely favourable in those patients who had been given efocaine, but it is well recognized that such impressions must be accepted with reserve, and may even on occasion be misleading. This is well shown in Table IV, from which it can be seen that as many as 29% of the patients in the control group stated that they were free of pain. The high percentage of error in the physiotherapists' report serves to confirm this difficulty—from Table V it can be seen that, because of their apparent freedom from pain, they thought that 40% of the control group had been given efocaine.

The differences in the dosage of post-operative analgesics (Table VI), whilst more impressive and apparently statistically significant, are not so striking as those recorded by previous writers. Boere,[16] for example, found that in 42 out of 50 cases he did not require any post-operative drugs; in this survey only 5 of the 46 patients who had been given efocaine required no analgesics at all in the first 24 hours. With any marked reduction of pain, such as the efocaine group seems to show, one would expect the patient to breathe more deeply and cough more freely, with a concomitant reduction in the incidence of such complications as atelectasis; in this series, however, there is no difference between the 2 groups. This bears out the report of Nowill *et al.*,[13] who also found no difference in the incidence of atelectasis post-operatively in over 100 cases.

With regard to complications attributable to efocaine itself, the position becomes serious. In the past 2 years there have been a number of reports of damage to the nervous system following its use. Most of these have been a transverse myelitis of the spinal cord following paravertebral injections;[13, 18–24] others have been a toxic neuritis of plexuses or nerves[13, 18, 21, 24] or an involvement of the sympathetic.[24] The mechanism of the transverse myelitis has been postulated to be a spread of the solution centrally to reach the parenchyma of the cord *via* the perineural spaces of the nerves and roots,[23] or a thrombosis of the intercostal vein and artery,[19] and one or

other of these processes probably was responsible for the one mishap which occurred in this series.

SUMMARY AND CONCLUSIONS

A series of 46 thoracotomies were injected with efocaine into the intercostal nerves at the end of operation, and their post-operative course compared with a control series of 48 cases.

Subjectively, the patients given efocaine were more comfortable, had less pain and were easier to nurse than those in the control group.

TABLE I. NUMBER OF CASES

Operation	*With Efocaine*	*Without Efocaine*
Pneumonectomies	7	13
Lobectomies	11	13
Segmental Resections	15	8
Other Thoracotomies	13	14
Total	46	48

TABLE II. AGE DISTRIBUTION

Age-Group	*With Efocaine*	*Without Efocaine*
0—	4	3
10—	6	10
20—	17	16
30—	7	10
40—	7	4
50—	5	4
60 and over	—	1
Total	46	48
	Years	*Years*
Mean Age	29·1	29·1
Standard Deviation	13·6	13·3
Coefficient of Variation	46·7	45·7

TABLE III. WEIGHT DISTRIBUTION

Weight	*With Efocaine*	*Without Efocaine*
0	—	—
2 stone	4	4
4 stone	2	—
6 stone	3	7
8 stone	16	13
10 stone	17	21
12 stone and over	4	3
Total	46	48
Mean Weight	9 stone 2 lb	9 stone 4 lb
Standard Deviation	33·6 lb	34·5 lb
Coefficient of Variation	26·25	26·53

TABLE IV. PATIENTS' COMMENTS

	With Efocaine		*Without Efocaine*	
No pain	(24)	52%	(14)	29%
Some pain	(18)	39%	(16)	33%
Severe pain	(4)	9%	(18)	38%

TABLE V. PHYSIOTHERAPISTS' REPORT

	With Efocaine		*Without Efocaine*		*All Cases*	
Correct identification	(34)	74%	(21)	44%	(55)	58%
Wrong identification	(6)	13%	(19)	40%	(25)	27%
Doubtful	(6)	13%	(8)	16%	(14)	15%

TABLE VII. COMPLICATIONS OF THE OPERATIVE PROCEDURE

	With Efocaine		*Without Efocaine*	
Collapse: Ipsilateral	(2)	4·3%	(2)	4·2%
Contralateral	(4)	8·7%	(4)	8·3%
Persistence of air	(3)	6·5%	(5)	10·4%
Persistence of fluid	(0)	—	(3)	6·3%
Total	(9)	19·5%	(14)	29·2%

TABLE VI. POST-OPERATIVE ANALGESICS

	1st 24 hours		*1st 48 hours*		*1st 72 hours*	
	With	*Without*	*With*	*Without*	*With*	*Without*
Pethidine (Milligrams)						
Total dosage	6,380	9,850	11,600	17,005	15,230	21,270
No. of cases	41	46	43	47	43	47
Average dose per case	156	214	270	354	361	453
t		2·94[1]		3·22[1]		1·90[3]
Average dose per stone	17	24	30	39	39	49
t						2·22[2]
Dromoran (Milligrams)						
Total dosage	2	22	22	83	45	127·5
No. of cases	1	5	6	9	7	13
Average dose per case	2	4·4	3·6	9·2	6·4	9·8
t				3·66[1]		1·16
Average dose per stone	0·175	0·471	0·368	0·894	0·655	0·952
t						1·03
Mist. Veganin (Drachms)						
Total dosage	16	6	50	85	158	240
No. of cases	5	2	11	14	25	29
Average dose per case	3·2	3·0	4·5	6·0	6·3	8·3
t		0·204		1·22		1·33
Average dose per stone	0·559	0·414	0·611	0·808	0·730	0·914
t						0·78

1. Significant at 1% level. 2. Significant at 5% level. 3. Significant at 10% level.

Objectively, the dosage of post-operative analgesics required was less with the patients who had been given efocaine, a difference which was found to be statistically significant. However, the incidence of post-operative complications such as atelectasis was found to be similar in both groups.

A case is described in detail of a transverse myelitis of the spinal cord following the injection of efocaine into the intercostal nerves. Fortunately, the lesion was transient and the patient made a complete recovery.

My thanks are due to Mr. Dilwyn Thomas, Consultant Surgeon, Sully Thoracic Hospital, Cardiff, for permission to publish this report, to the medical and nursing staff for their help, and to Professor W. W. Mushin, Department of Anaesthetics, Cardiff, for his valuable advice and criticisms throughout the conduct of the series.

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*L. J. te Groen Medalje, vir die beste graduerende in Obstetrie en Ginekologie.
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South African Medical Journal

Suid-Afrikaanse Tydskrif vir Geneeskunde

VAN DIE REDAKSIE

DIE ETIOLOGIE VAN BLOEDVATSIEKTES MET VERHOOGDE BLOEDDRUK

Oor die algemeen beskou interniste ‚essensiële drukverhoging' (van die slagare) as 'n selfstandige siekte, nieteenstaande die menings van sommige werkers[1] dat persone met hoë bloeddruk, en sonder enige veroorsakende siekte, verteenwoordigend is van daardie deel van die bevolking wie se slagaarspanning hoër is as dié van 'n willekeurig uitgesoekte groep. Ander is van mening dat hoë bloeddruk as siekte miskien 'n metaboliese versteuring is waarby drukverhoging moontlik, hoewel nie noodwendig nie, 'n uitstaande kenmerk is.[2]

Dit blyk dat die meeste navorsers maar sal aanhou om selfstandige drukverhoging as 'n siekte te beskou. Dit kan nog steeds beskou word as iets wat nie uit die niere spruit nie; moontlik is die bynierskors van belang by hierdie kondisie.[3,4] Afdoende bewys oor die juiste aandeel van hierdie buislose klier en oor ander betrokke faktore moet nog gelewer word. Die ingewikkelde aard van hierdie onderwerp was beklemtoon deur die uiteenlopende menings uitgespreek in die Ciba-samespreking oor *Humoral and Neurogenic Factors in Hypertension* in 1954.[5]

Goldblatt se klassieke toetse om drukverhoging te verwek is vandag welbekend. Ook is dit vasgestel dat die drukverhoging wat deur die vrystelling van renin veroorsaak word later deur 'n buitenierse faktor in stand gehou kan word. Sommige werkers dink dat renin moontlik die zona glomerulosa van die bynierskors prikkel.[6] Die buitenierse werking van die bynier wat die ‚osmosekrag' van die uitgesitte volume van tussensélvloeistof beheer, staan moontlik in verband met die patogenese van drukverhoging. By die drukverhogingsimptome van swangerskap, is die bynierskors moontlik ook meer aktief as gewoonlik[4]—dit kan afgelei word uit die teenwoordigheid van ACTH-agtige stowwe in die weefsel van die nageboorte. Dus is kraamstuipe al veroorsaak deur inspuitings van bynierskorsekstrak; by swangerskapvergiftiging is die produksie van kortikoïede grootliks vermeerder.

Daar is kragtige stowwe in die bynierskors wat nog uitgeken moet word, en fyne ontleding van die uitvloeiende bloed uit die byniere deur steroïed-skeikundiges kan help om die probleem op te los. Dit word gemeen dat die bynier se aarbloed, benewens aldosteroon, 'n hele paar mineraalkortikoïede bevat.[8] Navorsing deur 'n hele paar werkers op die sogenaamde metakortikoïed-drukverhoging ondersteun die teorie dat mineraalkortikoïede by drukverhoging in die mens

EDITORIAL

THE AETIOLOGY OF HYPERTENSIVE VASCULAR DISEASE

'Essential (arterial) hypertension' is generally regarded by physicians as an entity, notwithstanding the views put forward by certain workers[1] that individuals with high levels of blood pressure represent a section of the population with arterial pressures higher than an arbitrarily selected normal, and with no disease to which these pressures can be attributed. Another recent view is that hypertensive vascular disease is possibly a metabolic disorder in which hypertension may or may not be a prominent feature.[2]

It seems that essential hypertension will continue to be considered by most workers as a disease. It can still be viewed as non-renal in origin and the adrenal cortex can be regarded as of importance in this condition.[3,4] Conclusive proof of the exact role of this endocrine gland, or of other factors concerned, remains to be established. The complicated nature of the subject of hypertension is revealed in the varied opinions expressed in the 1954 Ciba Symposium on Humoral and Neurogenic Factors in Hypertension.[5]

The classical experiments of Goldblatt in producing hypertension are now well known. It has further been established that the hypertension caused by the liberation of renin may later be maintained by another non-renal factor. Some believe renin may stimulate the zona glomerulosa of the adrenal cortex.[6] The extra-renal action of the adrenal gland in controlling the 'osmolarity' of the expanded extracellular fluid volume may be related to the pathogenesis of hypertension.[7] In the hypertensive syndromes of pregnancy there is also possibly increased adrenocortical activity[4] since, for example, ACTH-like substances have been demonstrated in placental tissue. Thus eclampsia has been produced by injections of adrenocortical extract; and corticoid production is greatly increased in toxaemia of pregnancy.

There are potent substances in the adrenal cortex that still remain to be identified, and detailed analysis by steroid chemists of the effluent blood from the adrenal may help to solve the problem. It is thought that there may be several mineralocorticoids present in adrenal venous blood in addition to aldosterone.[8] The

betrokke mag wees. Sommige werkers dink dat 'n abnormaal hoë konsentrasie van natrium *binne* (volgens andere, *buite*) die selle die grondoorsaak van verhoogde bloeddruk in die hartvate is. Dit is bewys dat die gemene faktor by alle soorte eksperimentele drukverhoging moontlik in verband staan met 'n verandering in die sodiumkonsentrasie in die hartspiere en are;[5] adrenalektomie en soutonthouding kan die ontwikkeling van drukverhoging stuit.

Dit is aangetoon dat die afskeiding van mineraalkortikoïede onafhanklik van glukokortikoïede wissel, en dat dit deur faktore buite die harsingslymklier beïnvloed word. Die zona glomerulosa is baie minder van die hipofise afhanklik as die ander twee streke van die bynierskors; dit kan blykbaar heel goed sy werk verrig sonder die hipofise, terwyl die ander twee streke sonder die hipofise verskrompel. By dierestudies moet dit egter onthou word dat die verskillende streke heelwat tussen verskillende diere varieer, sodat dit gevaarlik is om te veralgemeen. By 'n studie van die byniere van pasiënte met bloeddrukverhoging, wat 'n soutvrye dieet gehou het, kon geen gevolgtrekkings aangaande die rol van die bynierskors in die ontstaan van drukverhoging gemaak word nie. Sulke diëte kan egter die verhoogde natrium- of kaliumkonsentrasie in die are van die pasiënt verlaag.[9]

Die verskillende middels wat deesdae teen drukverhoging gebruik word wysig egter nie die grondslagtelike defek wat vir die siekte verantwoordelik is nie. Dit word gemeen dat Rauwolfia-alkaloïede 'n sentrale adrenergiese afsluitingswerking het. 'n Interessante voorstel is gemaak, nl. dat die stadige werking van hierdie alkaloïede moontlik dui op 'n aksie deur een of ander hormoon- of intermediêre meganismus—miskien die bynierskors se steroïede.[10]

Wat chirurgiese ingreep betref, is verdere waarnemings nodig om vas te stel of simpatektomie tesame met adrenalektomie, of net adrenalektomie alleen, die voortreflikste is. Verskeie navorsers het die kwessie van adrenalektomie bespreek veral wat selfstandige drukverhoging,[11] en drukverhoging in die Cushing-sindroom[12] betref.

Hierdie oorwegings dui op uiteindelike beheer oor drukverhoging met middels wat die werking van die simpatiese senuweestelsel beheer en die werking van die bynierskors strem. Uiteindelik mag chemiese hipofisektomie of chemiese adrenalektomie daarin slaag om bloeddrukverhoging te verbeter.[4] Doeltreffende middels is beskikbaar om die pasiënt in stand te hou indien 'n tekort aan bynierprodukte ontstaan.

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investigations of many workers on so-called meta-corticoid hypertension supports the hypothesis that mineralocorticoids may be involved in human hypertension. The basic cause of hypertensive cardiovascular disease has been regarded by some workers as abnormally high intracellular sodium; by others as extracellular sodium. Evidence has been advanced that in all the varieties of experimental hypertension the common factor may be related to altered concentration of sodium in heart muscle and the arteries;[5] adrenalectomy and salt depletion may prevent their development.

It has been demonstrated that the secretion of mineralocorticoid substances varies independently of glucocorticoids and is influenced by extrapituitary factors. The zona glomerulosa is far less dependent on the hypophysis that the other two zones of the adrenal cortex; it can apparently function well in the absence of the hypophysis while the other two zones undergo atrophy. In animal studies however it is important to remember that the different zones vary markedly in different animals so that it is dangerous to generalize about them. In a study of the zona glomerulosa of the adrenals in hypertensive patients who had received a salt-free diet, conclusions could not be drawn regarding the role of the adrenal cortex in the genesis of the hypertension; such diets may however lower the elevated sodium or potassium in the arteries of hypertensives.[9]

The various anti-hypertensive drugs used at present do not modify the fundamental defect responsible for hypertension. Rauwolfia alkaloids are regarded as having a central adrenergic blocking action, but the interesting suggestion has been made that the slowness of action of these alkaloids may indicate an action through some hormonal or other intermediate mechanism, possibly through steroids of the adrenal cortex.[10]

As far as surgical measures are concerned further observations are needed to show whether sympathectomy with adrenalectomy, or adrenalectomy alone, is superior. The question of adrenalectomy has been discussed by several investigators in its bearing on essential hypertension[11] and hypertension in Cushing's syndrome.[12]

These considerations point towards the eventual control of hypertension with drugs which control the activity of the sympathetic nervous system and the depression of the function of the adrenal cortex. By chemical hypophysectomy or chemical adrenalectomy improvement in hypertensive vascular disease may ultimately be achieved.[4] Suitable agents are available to maintain the patient in the event of adrenal insufficiency being produced.

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THE SOCIOLOGICAL PROBLEMS OF CEREBRAL PALSY*

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Disability due to cerebral palsy is not simply a medical problem; it is an important sociological problem, requiring the cooperative services of not only medical experts but also a balanced team of well-trained therapists. The whole family of the patient is affected financially, emotionally, and through the necessity of active participation in his habilitation. The whole nation is affected in that local, provincial and Union authorities must all work together to give victims of cerebral palsy the maximum facilities for habilitation.

In America pioneers like Phelps, Carlson and Perstein have spent many years working on the problem of cerebral palsy, and their efforts have resulted in the recent establishment of many schools and research centres in America. The United Cerebral Palsy Association of America grants research fellowships, and conducts a strong propaganda campaign to inform the public about cerebral palsy. In the United Kingdom, also, many schools have sprung up in the last 5 years and an attempt to coordinate their activities is being tried by the British Council for the Care of Spastics. A number of excellent comprehensive surveys from Britain and America are available in estimating the extent of the problem in South Africa.

Definition. Cerebral palsy has been defined by various Californian workers as a brain disturbance resulting in impaired motor function. The muscles affected may be few or many and the types of muscle disturbance vary. There is frequently an associated mental retardation, and sensory defects of vision, hearing or perception may also be present.

Incidence

Concerning the incidence of cerebral palsy, the most often quoted figures are those of Phelps, who in 1940 surveyed the state of New Jersey and found that there was a yearly birth-rate of 7 cerebral-palsy cases per 100,000 of the population; one of the 7 died at an early age. This meant that up to the age of 16 there was a total of 90 per 100,000 of the population. Assuming that 25% of the population are children, this would mean an incidence of 3·8 per 1,000 of the total child population.

In 1948 the Educational Advisory Committee of the British Council for the Welfare of Spastics asked all local authorities in England and Wales to supply data on the incidence of cerebral palsy in their areas. Of 147 authorities approached only 101 supplied complete statistics. This showed an incidence which ranged between 0·1 and 2·4 per 1,000 of the child population. It also showed that the rural incidence was no higher than the urban areas, indicating that the standard of medical care does not appear to be a causative factor.

In 1943 the Illinois Commission surveyed the incidence of cerebral palsy in this state and found that the incidence was 2·2 per 1,000 of the child population. In the State of California a survey was made of the school-going population, i.e. between the ages of 9 and 16, and a total of 800 cases were found. On the assumption that the cases in the whole child population numbered twice this amount, the incidence would be 1 per 1,000 of the child population of California.

If it is assumed from these statistics that the incidence in white children in South Africa is between 1·0 and 2·2 per 1,000, then with a white population of nearly 3,000,000 (on the basis that 1/5th of the population are children) there will be between 600 and 1,300 cases of cerebral palsy. (Only the white population is discussed because educational facilities for normal non-whites are inadequate and certainly would require priority.) The number of children therefore who are suffering from cerebral palsy are about the same as those suffering from blindness or deafness.

A working basis would therefore be the assumption that there are approximately 1,000 white children suffering from cerebral palsy in South Africa. This figure would be fairly constant from year to year, since the number of new cases each year would be equivalent to those reaching the age of 16.

Placing of Children

These children can firstly be divided into two broad groups, namely the educable and the ineducable. The ineducable are about 40% of the total, on the basis of a number of surveys in America and Britain; i.e. 400 cases. About 10% of the total would be mild enough to go to ordinary school.

This leaves 50% of the total, or 500 cases, which are educable and must be provided for. Of this amount about 200 would need residential accommodation, including those from rural areas and those from broken homes, and 300 will have to be cared for at day-schools. If 4 day-centres are provided to handle 50 each, then the remaining 100 could be placed in 4 or 5 schools of 20 to 25 each. A point which must be considered is whether residential and day scholars should be mixed; I personally feel that they should, for it means that the residential children will have more contact with the outside environment.

The figures which have been briefly outlined appear to be about the minimum requirements for the Union of South Africa. They put the problem in a better perspective and should make all interested bodies realize that this problem probably can be very adequately handled on a national level.

A special place for those who are ineducable is necessary. This is the responsibility of the Department of Health, but accommodation is very short, and many parents of retarded children have to wait 4 or 5 years before their children are suitably placed. If a special

*A Paper presented at the South African Congress, Pretoria, 1955

type of home were available for these children the parents would place them much earlier. This would save the whole family a great deal of financial hardship and indescribable emotional strain.

PRESENT FACILITIES

In South Africa the responsibility for the care of cerebral palsy has not yet been decided. The United Cerebral Palsy Association of South Africa is registered as the national welfare organization, but now no school for cerebral palsy is working in conjunction with it.

There are 2 schools devoted solely to the care of cerebral palsy in Johannesburg and Pretoria. The one in Johannesburg is a private organization; that at Pretoria, affiliated to the Cripple Care organization, accommodates about 40 pupils. In 1954 a Cerebral Palsy School was started in Cape Town and others are projected in other parts of South Africa. Cerebral palsied cases are cared for as a part of a general programme for handicapped children at Meerhof (near Pretoria) and at the Open Air School at Durban, both of which are the responsibility of the provincial administrations. A few cases are cared for at the Kimberley School for Handicapped Children, an institution of the Union Government.

What is badly needed is a plan for the whole Union for the care of all cases of cerebral palsy, whether educable or not.

The Forest Town School. Through the initiative of a few enthusiastic parents, Forest Town School was started 6 years ago in a small Scout Hall in Norwood, Johannesburg, with an enrolment of 5 children and one teacher. Within a year the school had moved to its quarters in Forest Town, which were loaned rent-free by the Transvaal Education Department. It rapidly outgrew these quarters and had to build additional accommodation. It now accommodates 74 children and has a staff of 17 teachers and therapists, which is nearly saturation point for this unit. Because of the necessity for individual tuition the classes are limited to a maximum of 12 pupils. Since each child must have daily physiotherapy there are 5 physiotherapists on the staff. Most of the children daily attend the occupational therapy department, which has 2 therapists. Speech therapy is administered to those who require it (40 at present), by 2 therapists.

The children in the older groups attend school from 8 a.m. to 2 p.m. and are provided with a hot lunch, which is served in the dining-room by the staff and 4 maids. This also provides an opportunity for the occupational therapists to teach self-feeding. The school is under the direction of a management committee which has an active fund-raising sub-committee. The expenses are approximately £13,000 a year, of which £3,000 was provided by the Transvaal Education Department until March 1955, when the responsibility was transferred to the Union Government by the Special Schools Act. The cost per child at this day-school, at which adequate therapy is provided, is approximately £170 a year. This includes transportation, which is provided by the school. At one time the school had a bus, but a more satisfactory arrangement has been the use of taxis, which are partly subsidized by the parents. The fee charged for each child is £40 a year but in many cases the parents are unable to contribute and the fee has been waived.

Parents. It is essential for the successful running of the school to enlist the cooperation of the parents, since training at the school must be aided and abetted by home care and encouragement. Parents realize that their child is not following the normal development pattern, when he fails to smile, grasp his toys, or sit at the usual ages. At 6 months it is possible to make a diagnosis of cerebral palsy with a fair degree of accuracy. It should then be explained to the parents what cerebral palsy means and what can be achieved in training and education. The two most important factors for a good prognosis are educability, which depends on a normal intelligence level, and a reasonable degree of motor mobility. Long before educability can be assessed, exercises must be initiated at home, under guidance. The child's growth and development must be carefully watched. By the time he is 2 years old his intelligence can be fairly well assessed and this is the time he must be admitted to a cerebral palsy school. Early admission is important because contractures will be avoided and by the time he starts normal education he is psychologically adjusted both to his disability and to the school environment. Also during these early years the parents are educated in cerebral palsy, trained to assist by home treatment and advised on how to fit the handicapped child into the family group. It must be explained to them that cerebral palsy is not inherited and it is therefore most unlikely that another child in the same family will develop the same disability.

Because treatment is very slow and lengthy, parents often become despondent and may reject the child by either neglect or over-solicitousness. In either case the child loses interest and does not try to help himself. By discussing their problems at parents' meetings, the parents learn new ways to stimulate greater effort in the child. There is no panacea for cerebral palsy—no wonder-drug or miracle cure. The time wasted in running after short cuts may be critical. Unless training is initiated early the maximum benefit cannot be achieved.

Cases with severe physical disability or mental retardation who have not benefited by a reasonable period at a cerebral palsy school are ineducable and should be placed in a special hostel. If such places were available parents would more readily accept the fact that their child cannot be helped at a cerebral palsy school.

Medical Profession. The medical profession is directly concerned in the problem of cerebral palsy in two aspects. The first is medical research, which is mainly the concern of full-time workers who are interested in obstetrics, neuro-physiology and pharmacology, and does not directly affect the doctor who is caring for the patient. The second is the everyday care of the cerebral palsy case. That is the concern of the general practitioner and paediatrician, who are in intimate contact with the whole family and are directly associated with the therapy, education and total habilitation of the case.

The doctor is aware from the first day of life that there was a difficult labour or that the child was excessively jaundiced or cyanosed, or was premature, or had convulsions in the newborn period. In all such cases it is imperative to keep a close watch on the growth and

development of the child. The moment any motor disturbance is noted it is essential to obtain expert guidance. Some practitioners misguidedly tell parents that nothing should be done at this stage and that the child is simply a little slow, not realizing the importance of early training. As the doctor is in intimate contact with the whole family he can be of great help in giving them correct advice and reassurance. In no instance is this more important than when it is shown that the child is not educable and should be placed in custodial care. There is no tragedy greater than seeing parents devote their whole lives to helping a severely handicapped child who can show no advancement at all.

Available to the cerebral palsy centre, there should be a panel of specialists whom the staff can consult as special problems arise. On this panel there should be an orthopaedist, a neurologist, a psychiatrist, an ophthalmologist, an otolaryngologist, a specialist in physical medicine, a dental surgeon and a paediatrician.

Vocational Guidance. The problem of cerebral palsy must be faced in its entirety and this includes the future welfare of the child. The child who is completely cured needs no further special attention but the one who is left with some physical disability does. It must be realized that nothing would be achieved if these children were educated and then sent out to fend for themselves. They must be placed in gainful employment, like people with other handicaps. The Union Government has established a Rehabilitation Council and it is very important that somebody working on the problem of cerebral palsy should be appointed to this body, for in no branch of disability is such a comprehensive organization necessary for full habilitation.

Vocational training is a task which can be jointly undertaken by Cripple Care and Cerebral Palsy organizations. A plan should be devised whereby children leaving school are sent either to universities, colleges, or trade schools. At the trade school facilities should be available for teaching commercial subjects, painting, jewellery-making, optical mechanics, sewing, telephone-switchboard operating and other trades. After they have learned a trade Industry must come forward and play its part in the placing of handicapped personnel in jobs. Should they fail to assist in this manner, legislation might be created whereby a certain proportion of the personnel employed must be handicapped persons; in England legislation on these lines is in operation.

Those cases which are severely disabled should be placed in sheltered employment. Besides being given an occupation they should be provided with a recreational centre. I believe that many organizations would be willing to play their part in such a scheme, such as Red Cross, St. John, the National War Memorial Foundation, the Chamber of Mines, and the Chambers of Commerce and Industry.

The Public. At present, the care of cerebral palsied children depends on the generosity of the public. Treatment is long and costly, and until a government agency assumes full financial responsibility for it, the public must be constantly approached for its help. Through propaganda they will appreciate the magnitude and complexity of the problem and will be encouraged to give support to it. Through educational propaganda also, they will learn to accept the cerebral palsied victim as a useful member of society and will help to see that he is placed in gainful employment. This year the Union Government has taken over responsibility for cerebral palsied children.

Union Government. Under the Special Schools Act (No. 9 of 1948) provision was made whereby Cerebral Palsy children became the responsibility of the Union Government. Under this Act private welfare organizations could establish schools which if approved would be subsidized and supervised by the Union Education Department; the Government pays 100% of the salaries of approved teachers, 66·6% of those of therapists, and 50% of the cost of buildings and administrative costs. This handsome support on behalf of cerebral palsied children on the part of the Government will help greatly in the establishment of the necessary schools.

The shortcomings of the Act are that private and local bodies must initiate the schemes before the Government gives a helping hand. Moreover the Act makes no provision for non-educable children, whose needs are perhaps greater than those of the educable cases, even though very little improvement can be expected in them. I feel that a special home which could provide custodial care for these children is urgently needed.

CONCLUSIONS

A scheme for the setting up of sufficient schools for the care of cerebral palsy has been outlined. This should be a scheme for the whole of the Union of South Africa. Stress has been laid on the fact that the problem concerns both educable and non-educable children.

The Forest Town School has been mentioned to show the type of staff that is necessary for the efficient running of a cerebral palsy school and also the financial implications of such an undertaking. What has been said applies also to the school at Pretoria.

Cerebral palsy affects not only the individual afflicted, but also his whole family. They need the utmost consideration from the medical profession and the public, and also from Government agencies, which can help them in many ways.

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DOCTORS' TOUR OF EUROPE

A number of doctors and their wives are planning to visit Europe this year and tentative arrangements have been made to organize the tour, starting on 27 May, to take in the B.M.A. Congress at Brighton, which commences on 9 July, and the tour which will last 2½ months will include Israel, Greece, Italy, France, Switzerland, England, Sweden, Norway, Denmark and Holland. Details can be obtained from Dr. J. H. Struthers, Room 28, Administrative Buildings, General Hospital, Pretoria, or from Dr. E. B. Woolff, 34 Jan Smuts Avenue, Forest Town, Johannesburg.

TREATMENT OF CEREBRAL PALSIED CHILDREN WITH CHLORPROMAZINE

A PRELIMINARY REPORT *

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When chlorpromazine was first introduced, the possibility of using it in cases of cerebral palsy immediately suggested itself to us at the Pretoria School for Cerebral Palsied Children. The reports of adverse affects at that time were more limited than now, and any dangers encountered by the use of chlorpromazine must now be more seriously considered.

Brief Review of Previous Drug Therapy

Anti-epileptic drugs have only been found of value in children who suffer from cerebral palsy when they have concomitant convulsive seizures. Tridione, however, has been of limited value in 50% of athetoid children; but strict control is necessary in its administration.

Prostigmine, which affects the myoneural junction, has very little effect where the pathological changes are situated higher up in the central nervous system.

Tolserol and other related drugs have been found to possess no value or very little indeed. After inhalation of 30% carbon dioxide, transient relaxation has been observed.

Curare does release tension, but it is dangerous for continued and routine use, and must be administered by injection. After anaesthesia, especially ether, children may walk and talk better, often for a week afterwards. A couple of years ago Perlstein stated that the best drug known to him for cases of cerebral palsy was alcohol.

Pharmacological Action of Chlorpromazine

Chlorpromazine acting cerebrally depresses many functions. It facilitates induction of hypothermia and suppresses febrile response to pyrogens. It leads to reduced oxygen-intake, and the suppression of conditioned reflex-responses and vomiting of central origin. It also enhances the effects of hypnotics, analgesics and anaesthetics. In thalamic or diencephalic animals (cats) 'sham rage' can be suppressed.

The systemic administration of chlorpromazine appears to modify the effects of gallamine triethiodide in the experimental animal without altering its toxicity. This may be an additive effect of muscle relaxation produced at different sites. The exact site and mechanism of this action is uncertain, but it has frequently been observed that chlorpromazine, given alone, has as one of its motor effects the production of hypotonia in voluntary muscle. The drug has also been shown to have a weak spasmolytic action in the antagonism of acetylcholine effects.

MATERIAL AND METHODS

When assessing the effect of any treatment on the performance of children, the factors of maturation and learning cannot be ignored. As no two cerebral palsied children at the Pretoria School are comparable in respect of age, clinical condition etc., it has been deemed impossible to select two groups of comparable individuals, one to act as control for the other. Thus one was forced to use each individual as his own control case by comparing performance on several occasions while undergoing treatment and while not receiving treatment. The testing period extended over several months.

Ten subjects in the Pretoria School for Cerebral Palsied Children were selected and given treatment with chlorpromazine.

Performance was assessed, especially on the following points:

1. School work: Here the collaboration of teachers was sought. It is impossible for a doctor to apply any tests in order to measure improvement. We had to rely on experienced teachers who had been dealing with the children for months, and who were in a better position to assess improvement. Handwriting, in particular, was useful for comparing progress, but other abilities such as arithmetical achievement and general scholastic ability was taken into consideration. Where teachers noticed improvement, their observations were invariably corroborated by the parent or parents, whenever the latter were interrogated.

2. Physiotherapy and speech therapy: The physiotherapist was interviewed regarding concentration and performance. The one child with athetosis and deafness showed an improvement in speech and hearing.

3. Concentration: Ability to perform school work and apply oneself to therapy, games etc. was analysed. Not only the teachers but also the mothers of treated children were interviewed.

Dangers and Precautions

At the commencement of treatment blood-pressure readings were taken but as they did not show any definite drop after chlorpromazine was given, later readings were omitted. Occasional blood smears were taken for evidence of granulopenia, and where the child's condition

* Presented at the South African Medical Congress, Pretoria, 1955.

appeared off-colour, the erythrocyte sedimention rate was tested. Where the liver is affected and jaundice occurs, the E.S.R. becomes elevated. Such jaundice may be due to drug allergy, which causes oedema of the hepatic cells and consequent biliary obstruction. None of our cases developed jaundice.

The reports in the literature of granulopenia and jaundice following chlorpromazine therapy indicate that the treatment is not free from danger, and should only be carried out where children are kept under close observation. It would seem that long-term treatment should be avoided in view of possible dangers and the rather limited value of treatment.

TABLE I

Patient	*Age (years)*	*Diagnosis*	*Results*
1.	13	Ataxia	Moderate improvement in concentration and general performance. Much calmer.
2.	18	Spastic hemiplegia ? athetoid	No improvement.
3.	7	Spastic triplegia	No improvement. Listless during treatment.
4.	3½	Spastic monoplegia	No improvement.
5.	8	Athetosis and deafness	Marked improvement. Better concentration and better performance, especially noticeable in school work, and in temperament at home. (When alcohol was added no further improvement was noticed.)
6.	8½	Hemiplegia, mainly right upper limb	Slight improvement. A tremor of the right hand disappeared during treatment.
7.	11	Athetosis	Slight improvement. When alcohol was added no additional improvement was noted.
8.	10	Ataxia	No improvement. Listless during treatment.
9.	8	Spastic quadriplegia	Slight improvement. Brighter, more alert. Took more interest in his school work.
10.	9½	Choreo-athetosis	Slight improvement. Calmer, steadier, less excitable and concentrated better.

RESULTS

Chlorpromazine was used in 10 cases. The particulars and results are shown in Table I. The average dose varied from 10 to 25 mg. 3 times a day, depending on age. Small children who were unable to swallow tablets were given the drug in the form of a syrup. It was administered thrice daily at the school, and over weekends a sufficient quantity was given to the parents to continue treatment. After a period of 3 weeks, 2 children were observed to have shown marked improvement (cases 1 and 5). Four children showed no improvement; 2 of these in fact became listless. The remaining 4 children appeared somewhat calmer and more tractable, but certainly not dramatically so. Treatment was discontinued in all but the 2 cases where marked progress had occurred. Performance was assessed several times during periods while the drug was discontinued, and once again improved when treatment was recommenced. This procedure was repeated 3 times in each child, with very definite results.

The next stage will be to observe the subjects after administration of inert control tablets (placebo) resembling the genuine tablets, without the children or teachers or parents being informed of the substitution.

The future of drug therapy in cerebral palsy may lie with the use of chlorpromazine in addition to the other drugs, such as Reserpine or alcohol. Perlstein has stated that in his experience the only drug which is of value in cerebral palsy is alcohol, which has a definite relaxing effect; in 2 of our cases, where chlorpromazine was combined with alcohol, no additional improvement was noted. Recently it has been claimed that Reserpine (rauwolfia) has a similar action to chlorpromazine, without the potentially dangerous side-effects. It is also contemplated using drug therapy combined with CO_2 inhalation.

SUMMARY AND CONCLUSIONS

We are handicapped by the absence of any specific objective tests whereby to assess improvement. We have to rely on general observation over a period. Of the 10 cases in which chlorpromazine was used, 4 did not show any favourable response (2 of these appeared more listless than usual); 2 showed definite improvement, the one almost dramatically; 4 showed slight general improvement, but not, in our estimation, sufficient to justify prolonged treatment. The one case in which improvement was almost dramatic was suffering from athetosis, deafness and speech difficulties. One gets the impression that children who show improvement are those suffering from dyskinesia, i.e. disturbances in movement or tone, e.g. chorea, athetosis, tremor.

At present it is suggested that chlorpromazine be used in certain selected cases of cerebral palsy who are going through a 'difficult period'. It is our experience at the School that these periods are commoner and more protracted in children with cerebral palsy than in normal children. Many of our children who appear to be making progress suddenly cease to improve and very frequently regress, so that for weeks and even months they may be 'in the doldrums'. Psychological factors may play a part in the production of these lapses. Anxiety, stress, feelings of inferiority experienced by these children in the presence of normal children or their normal sibs, and parental reactions to their handicapped child, all tend to affect the child's responsiveness to schooling and therapy. For cases of this type, controlled drug-therapy appears to be of value.

I should like to thank the Board of the School for Cerebral Palsied Children, Pretoria, for permission to carry out the investigation, and also the parents and teachers who cooperated. The chlorpromazine (Largactil) used in this study was kindly supplied by Messrs. Maybaker, to whom we are indebted for their close cooperation.

MODERN METHODS IN THE TREATMENT AND MANAGEMENT OF CEREBRAL PALSY*

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Since cerebral palsy is a group of conditions which vary one from the other as the clinical features of spasticity, athetosis, ataxia, tremor, rigidity or atony predominate, there can obviously be no single form of treatment which is universally successful.

All types have one feature in common—a disorder of muscular function—and it is towards the amelioration of this symptom that most forms of treatment have been directed during the last few years. It must be realized that, difficult as is the management of cerebral palsy, it may be made even more complicated by associated mental, visual, auditory and speech defects and, perhaps of even greater importance, by the emotional conflicts which all too frequently arise between the child and his immediate family circle. The occurrence of epilepsy—which is by no means rare—may aggravate still further the burden the child has to bear. To concentrate on the treatment of the neuromuscular defect to the exclusion of these additional complicating factors will almost certainly detract from the efficiency of the therapeutic programme; thus, it is essential that each child should be treated as an individual, and the programme modified or expanded to embrace not only the whole child but his environment, and that the methods adopted should be sufficiently elastic to permit of the introduction of any particular feature of any specialized system which knowledge or experience suggests is likely to be of benefit to the child. Treatment may therefore be classified under 3 main headings: (1) Medication, (2) Surgery, and (3) Education.

(1) MEDICATION

(*a*) *Drugs*

Of the large and increasing number of drugs used in the treatment of cerebral palsy none, in the author's experience, has had more than a temporary effect; and not one can be said to possess a specific curative action; even curare which, on occasions, has had an astonishingly relaxing effect, exercises this for a limited period only and with little or no 'carry-over'. Controlled experiments undertaken at Westerlea with Myanesin, Mysoline and Lysivane failed to demonstrate any permanent improvement in cerebral palsy. At the present time, therefore, all that we can expect therapeutically is a temporary control of the convulsive seizures, with perhaps some transient diminution in muscular spasm and overflow activity. Of all the drugs alcohol is still the most constant in its action and the most effective in its relaxing results; but unfortunately it is transient in its effect and dangerous from its habit-forming tendency.

(*b*) *Hypnosis*

While perhaps not strictly classifiable under this heading, hypnosis—like Yoga—may provide an additional avenue of attack in our fight for the rehabilitation of the cerebral palsied child. These children are subject to suggestion from within and without, and if by means of hypnosis we can lessen the bombardment of their central nervous system by a multiplicity of external stimuli, and so increase their powers of concentration, an appreciable improvement in their physical state will result.

(2) SURGERY

(*a*) *Braces and Casts*

Under this general heading are included standing tables, stabilizers, skis, and walking trolleys, all of which may be used in sequence as a progressive form of bracing in the acquisition of balance and walking skill.

In the spastic, deformity can be prevented, or, if already established, in many cases corrected, by bracing. Flexion spasm of the knees or hips and adductor spasm or equinus deformity will respond to bracing except in the grosser forms or where severe contracture is already present.

In the athetoid, braces are not supportive but are used to control the direction of movement and to block involuntary motion. They control the joints, help to reduce overflow, and therefore aid relaxation. 'The braces, by blocking involuntary movements, are used in conjunction with functional exercises, to develop patterns of purposeful joint motion, which by constant repetition become automatic. These automatic patterns eventually become the conscious voluntary patterns necessary for the functional activities of daily life' (Keats). The athetoid control brace must be rigid, with well-locking hip and knee joints. They must not 'whip' or spring at the ankle, because this, by the resistance which it offers, only increases the power of involuntary movements and the plantar thrust in particular. There is no doubt that adequate and prolonged bracing can not only relieve spasm and excessive movement but may even suppress it; thus providing a 'carry-over' period of which the physical, occupational and speech therapists can make good training use, and the teacher direct to the acquisition of knowledge.

In short, intelligent bracing is effective in lessening spasm, in controlling involuntary movement, and in providing that necessary support without which balance and progression may not be acquired.

* A paper presented at the South African Medical Congress, Pretoria, October 1955.

(b) Prophylactic Surgery

To speak of prophylactic surgery in connexion with cerebral palsy is perhaps ill-advised, but the experiences of Sharpe and of Guthkelch do suggest that, in certain cases, lumbar puncture and subdural tap, with or without subsequent craniotomy, may, by relief of pressure and removal of blood clot, prevent the development of palsy. Once, however, the condition is established as a definite clinical entity, there is no cure.

Hemispherectomy in the spastic hemiplegic with severe epilepsy has been favourably reported upon by Krynauw and Cairns.* Good results have been reported also following cordotomy in severe athetosis; but a sufficiently long period of time has not yet elapsed to permit of a balanced opinion. The recent introduction of coagulation of the globus pallidus by neurosurgical methods may have far-reaching effects in the treatment of athetosis. The number of cases treated so far is small and, while remarkable results have been claimed, it must be realized that the method is not without serious risks.

(c) Orthopaedic Surgery

Orthopaedic surgery has a worth while contribution to make in the treatment and rehabilitation of the cerebrally palsied individual. Arthrodesis of the wrist, hip, knee and foot joints, with leg lengthening or shortening where required, has been successfully used in the treatment of both spastic and athetoid cases. Tendon transplantations, especially that of the hamstring tendons into the lower end of the femur, have been particularly effective in improving the gait and carriage of the spastic child suffering from severe flexion deformities of the hip and knee joints. In the author's experience the results of tendon transplantation in athetosis has been invariably bad. This is understandable when one considers that the error in the athetoid is probably one of integration or of short-circuiting at a higher level and not a local abnormality in the muscle itself and thus is not susceptible to improvement by peripheral surgery. With early diagnosis and early and adequate care the occurrence of deformity should become more and more rare; thus, surgery adapted for its correction will eventually become unnecessary.

(3) EDUCATION

I consider education as a collective term embracing not only the three Rs but the associated fields of occupational, physical and speech therapy. Mental development and muscle education or re-education are essential to highly coordinated activity, and together they form the ladder by means of which the cerebrally palsied child climbs to success. Carlson has pointed out again and again that a sense of self-worth gained from something attempted, something done, is a more powerful stimulus to further improvement than any medically prescribed modality. Similarly, an inward urge for intellectual development may be the initial stimulus and the continuing force which leads to betterment. Physical improvement and mental growth frequently go hand in hand, but sometimes the one may outpace the other. A marked improvement in physical performance may initiate a period of intellectual development and, in a similar fashion, mental growth from education may produce a reflex improvement in neuromuscular function. For these reasons we must not, on the grounds of physical retardation, deny educational opportunities up to the limit of the cerebrally palsied child's capacity.

Education is the birthright of every child of adequate mentality, and where the initial psychometric tests are indefinite the right of the child to an experimental period of trial must not be gainsaid. One cannot, however, leave the field of scholastic training without a note of warning in regard to the dangers of frustration which may follow ill-advised instruction and direction. There is no more pathetic ending to a brilliant scholastic career than continuing unemployment. More than one athetoid, following a distinguished University career, has failed to obtain employment because of his facial grimacing and incoordinate movements, and has ended a frustrated existence by suicide. Thus, the public and employing bodies must be educated to accept the cerebrally palsied child for employment, and teachers must learn to direct the energies of the brilliant athetoid only along lines of future promise. When the scholar is dull, or the future because of severe physical handicap is uncertain for the clever child, forced education except for self-satisfaction is unwise. In these cases a return to the land will give, if not a dazzling future, at least a life which is both productive and satisfying. The fruits of the land will sprout, grow and ripen just as luxuriantly for the cerebrally palsied as for the normal individual; and, in the reaping of a bumper harvest, bring content and satisfaction.

Physiotherapy

The aim of the physical therapist is to obtain muscular relaxation from which she may build up those controlled coordinated movements which are essential to balance and purposeful activities.

Relaxation is essential to the training of the athetoid but it is also necessary, although to a lesser degree, in the spastic. Each therapist must possess, not only the necessary enthusiasm, but also the essential qualities of personality, to enlist the cooperation of her patient, and to maintain this in a crescendo of active interest. These are the non-physical benefits of physical therapy upon which Dr. Perlstein lays much stress.

In recent years various forms of specialized treatment have been developed by different schools of thought—each enthusiastic about the special merits of its own method—yet the fact that there are many methods proves that no one is specific. Each, however, can contribute something to the habilitative programme and it is the author's belief that all methods should be used and adapted or modified as the case demands so that the patient may benefit. Probably the methods which are most popular today are those known by the names of their protagonists—Phelps, Jacobson, Carlson, Temple Fay, Bobath, etc.

* And more recently by McKissock. Nevertheless, even after this major procedure, some 16% of cases may still be subject to convulsive seizures.

Phelps states that accurate diagnosis must precede treatment. He emphasizes the importance of bracing by night and day in an endeavour to prevent deformity, but admits that this is not necessary in every case. Of equal importance is intensive regular physiotherapy, supplemented by occupational and speech therapy where these are indicated. In dealing with the young spastic case he advocates the use of repetitive movements to music. These movements are at first passive, then assistive; later, voluntary, and finally are carried out against resistance, in an endeavour to 'push out' the stretch reflex to the full; thus enabling the child to develop a full voluntary range of movement. Since the muscles which act on the affected joint or joints consist of spastic, normal and weak muscles, this form of treatment increases the tone in the weaker opponents as the tension in the spastic group diminishes, and leads to a general building-up of power in those muscles which are normal. In the older child who is capable of some voluntary control, music and singing are not considered to be necessary, but encouragement should be given to these children to carry through their exercises of their own volition with assistance where necessary.

In the athetoid group Dr. Phelps, in common with Jacobson, advocated the acquisition of a sense of relaxation, beginning in those muscles which acted on the larger joints (e.g. shoulder, hip, etc.), so that the patient could appreciate the difference between a muscle which was in the tension of activity and that which was completely relaxed. We believe that this ability can be developed more easily and more quickly in younger children by means of the rag doll. Once the patient has appreciated what is involved in relaxation and can voluntarily produce it, attempts are made thereafter to build up normal patterns of movement. Thus, Phelps makes use of certain of the positionings now described more fully by the Bobaths. He spoke of trigger zones in the arms or legs which could be found by searching—for example, complete flexion of the hips and knees leads to freer movements of the upper extremities; or, by extending the arm fully at the elbow with the wrist in flexion, less overflow develops in the opposite upper extremity. He does not, however, attribute this to any specific active inhibitory stimulation, as the Bobaths do.

To obtain success with the methods advocated by Jacobson perfect cooperation from the patient is necessary for a period of almost 18 months, during which time daily treatment is given, and, in addition, it must be possible for the patient to appreciate accurately the presence of muscle tension anywhere in the body. Re-educative exercises are begun only after full relaxation has been obtained. The demands made upon the patient's intelligence and cooperation are such that it is almost impossible to obtain the necessary degree of cooperation from the cerebrally palsied child. For this reason the method is rarely suitable for this type of case.

Carlson believes that the educational approach to the treatment of cerebral palsy is best. His first aim is to provide the child with some mode of self-expression, the greatest of which is speech. If speech is absent, however, he is taught to write or to type. Once the patient is able to express his thoughts or wishes, fuller consideration is given to the physical requirements necessary to an independent standing and walking balance.

Mechanical aids are used but are discarded progressively as the child develops increasing control of his muscles and the urge to carry out his exercises on his own.

As his educational horizon widens it not infrequently happens that his physical activities improve also. Advance in these directions increases the child's sense of personal worth which, in turn, provides that inward urge to still greater achievement in the academic and physical field. Carlson encourages the children in all forms of outdoor play and in organized games, and each child, irrespective of his handicap, plays a part even if it is only that of enthusiastic supporter.

No great effort is made to treat the case according to the type of cerebral palsy present, although physical, occupational and speech therapies are all used in an endeavour to obtain muscular relaxation; and from that ground level is built up voluntary purposeful movement. Because of Dr. Carlson's great personal influence and experience emotional disturbances are less frequent in in his clinic than in many others.

It is accepted generally that the initiation of a voluntary movement is a function of the cerebral motor cortex, and that severe damage to this area of the brain at birth or later may so injure it that this function is lost or so greatly impaired that recovery is doubtful. That recovery did take place in part in some cases was due, in *Temple Fay's* opinion, to the development of those primitive patterns of movement which were inherent in the mid-brain and spinal cord and which persisted after destruction of the higher centres. His method of treatment had its origin, therefore, in the earlier classical experimental work of Sherrington, who showed that if a painful stimulus were applied to the foot of a decapitated frog the whole leg was drawn away. This flexion movement of the hip and knee of the frog was described as a 'defence reflex' by Babinski. By making use of the 'defence reflex' and of the tonic neck-reflex we can not only develop the muscles involved in the movement performed, but we can obtain a reflex relaxation of their spastic antagonists or, to express this differently, a gradual depression with eventual elimination of the stretch reflex. Muscle-joint sense is developed and contact re-established with the remaining cells of the cerebral cortex of one or other side to produce coordinated muscular action and by the active repetition of these movements, at first homolateral or amphibian, and later crossed or reptilian, permanent patterns are developed.

Pari passu with this routine the children are taught to roll from side to side, to sit tailor-fashion, and to kneel and to crawl. Eventually they graduate to mechanical supports such as parallel bars, ropes, skis, etc. in the acquisition of a standing and a walking balance.

The Temple Fay treatment is based, therefore, on the assumption that brain damage in cerebral palsy is such that the affected child must function more from the mid-brain than from the cortex and that treatment, to be effective, must develop the movements which arise at this level.

The persistence of these reflexes which, under normal conditions of development, disappear early is responsible,

in the view of the *Bobaths*, for the features and symptoms presented by the cerebrally palsied child. The continuing presence of these reflexes is related to the cerebral defect, be it developmental or acquired at birth as the result of trauma or anoxia.

The extensor or flexor spasm seen in cerebral palsy cases can be inhibited by positioning and, by so doing, the passage of normal impulses to the opposing muscle-group facilitated, they claim; thereby encouraging the development of normal patterns of movement.

The Bobaths rightly emphasize the importance of pattern movements and stress, and, in particular, the relationship between the head, the shoulders and or the arms, and the symmetrical neck-reflex (full flexion of the neck leads to flexion of the upper and extension of the lower limbs, whereas extension of the head causes the fore limbs to extend and the hind ones to flex). In the asymmetrical tonic neck-reflex the head turns towards the extended arm; but, even where extension of the arm does not occur as the head rotates to one side or other, relaxation in the flexor muscles of that limb, with a relative increase in tone in the extensors, takes place.

If muscles are stretched during the performance of a particular pattern of movement, I believe contracture can be overcome without inducing a spasm in the other limbs or increasing tension. From this point of view the Bobath treatment is effective, but that it is effective as the result of stimulating definite inhibitory impulses, which permit of movement in muscles previously prevented from so functioning by tension now inhibited, is another story.

At *Westerlea* we have found that good results have followed the use of all 'systems' and that there is, therefore, no specific method. Since certain features of all the methods are beneficial from time to time in different cases, those which by previous experience have been found to be effective should be used. Of equal importance, however, is the realization that simple treatment of the neuromotor defect is not sufficient, but that the whole child and even the whole family unit must be embraced, so that emotional influences which may frequently retard or even interfere with treatment may be eliminated.

Occupational Therapy

Occupational therapy has, in association with speech and physical therapy, an important role to play in the treatment of the spastic child. Here also muscle relaxation is the initial step to muscle education, without which purposeful action cannot take place. Thus physical therapy, by producing relaxation, lays the foundation stone upon which the other therapies build; and all three must work in cooperation not only with each other but with the teachers and the house mothers so that an integrated progressive pattern is developed. Generally, it is customary for the physiotherapist to concentrate on the development of balance in the head so that the child may sit, eventually crawl, roll over, stand and walk; from which point the occupational therapist develops co-ordinated activities in the upper limbs with the purpose of developing in the child the ability to feed and dress. She also, in company with the speech therapist and house mother, develops still further the feeding, bathing and dressing activities of the patient. The essential point in any residential school is cooperation between the teachers and therapists and medical staff. Lack of cooperation and harmony in the staff is immediately sensed by the pupils and has its reflection in their failing efforts and lack of drive.

These are the methods by which the educable cerebrally palsied child is trained to become economically independent and to develop into a valuable member of the community. Unfortunately, not all members of this group do attain to this happy state. Where the child is considered to be ineducable, and even in certain cases where the IQ is above 80, routine formal education is almost a waste of time; yet certain aspects of academic training can be grasped and these should be taught not merely as a background to the more routine forms of manual training but in the hope that considerable personal pleasure and enjoyment may develop from it. In the latter group training may in many cases begin at 12 years; for some, however, because of manipulative difficulty training may with advantage be delayed for a year or two. During school years these handcrafts should be channelled into more advanced training for those capable of benefiting from it, so that their interests and skills may qualify them for further experience in workshops, market gardening, farming, etc. It is unusual to find a child severely handicapped by cerebral palsy who is capable of carrying through any manufacturing process from the beginning to the end. For this reason it is desirable that all specialized workshops should be open to all forms of physical handicap, congenital or acquired, in order that what is initiated by one group can be finished by another; and thus, by cooperative effort, economics may play a part in the efficient functioning of the scheme as a whole. In certain cases the workshop will require to be combined with residential accommodation and in most instances marketing of the finished article will be the responsibility of the administration.

Finally, there are those who are mentally alert but so severely handicapped physically that the performance of any routine task will forever be beyond their capabilities; and in the lower mental group there may be those who, although but slightly handicapped physically, lack concentration and the capacity for independent existence. For this varied group some form of permanent residential care will be necessary, and it must be provided in an atmosphere free from the stigma of the mental institution, and in surroundings which are homelike and from which good care and affection have not been excluded by cold rigid efficiency.

SADDLE EMBOLISM OF THE AORTA

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Saddle embolism of the aorta is not a common condition and few cases of it are encountered by any single individual in a lifetime of practice. At the time of writing, there are only some 200 recorded cases, amongst which there are 40 cases of success following aortic embolectomy. We have considered it worthwhile therefore, to add our own case to those recorded in the literature.

CASE REPORT

A 52-year-old Coloured male was admitted on 17 September 1954. While walking at 2 p.m. that afternoon he perceived a sensation of pins and needles in the soles of both feet. He sat down for a few minutes to rest but when he stood again he was unable to walk. Both feet felt cold and pain developed in the right calf. Associated with these symptoms there was also a cramp-like sensation in both buttocks.

A relevant incident in the past history was an attack of exertional dyspnoea, sudden in onset, which occurred 3 weeks before admission, with inability to lie flat in bed because of breathlessness. These symptoms lasted for 1 week.

On admission, 7½ hours after the onset of symptoms, the patient was not very distressed. The pulse rate was 80 per minute and the blood pressure 110/90 mm. Hg, and there were no other signs of shock. Clinical examination of the heart revealed no abnormalities.

The patient was completely unable to move his right leg and could flex the left knee only with difficulty. Both legs were ice-cold from the toes to the knees and were pale up to this level. The femoral, popliteal and pedal pulses were absent in both legs and, although pulsation of the abdominal aorta was easily felt, there was no lower abdominal tenderness.

Neurological examination revealed absence of the knee jerk and ankle jerk on the right and of the left ankle jerk, but the left knee jerk could, with difficulty, be elicited. There was loss of sensation to pin-prick and light touch in both legs involving an irregular area unrelated to somatic nerve distribution. On the right side this area of anaesthesia extended to the mid-thigh on the medial side. There was no appreciation of vibration sense up to the level of the knees on either side.

While arrangements for operation were being made reflex heating by electric blanket applied to the trunk with the lower extremities exposed produced no clinical improvement after 1 hour.

Operation

A general anaesthetic was employed. Through a mid-line, transperitoneal approach the aorta and common iliac vessels were palpated. There was no pulsation in the distal ½ inch of the abdominal aorta or in the right and left common iliac arteries. These vessels were exposed after incising and reflecting the posterior parietal peritoneum and retracting the ureter and testicular vessels. A cylindrical embolus 3 inches in length and ½ inch in diameter was extracted through a longitudinal incision ¾ inch in length in the right common iliac artery. This appeared to have impacted in the proximal part of the right common iliac artery and distal aorta, producing obstruction to the left common iliac orifice without actually entering it. Fragments of distal thrombus were sucked out of the iliac vessels by means of a soft rubber catheter, after which the involved vessels were flushed successively with heparin and papaverin solutions. The linear incision in the right iliac artery was then repaired with interrupted everting sutures of No. 0000000 silk. No special clamps were used for the above procedure, adequate haemostasis being effected by broad linen tapes placed around the major vessels proximal and distal to the site of the embolus. Immediately after the operation femoral arterial pulsation was detected in both groins, the left pulse being stronger than the right, but the distal pulses were not palpable.

Post-Operative Course and Management

On return to the ward bilateral lumbar ganglionic block was performed with 2% novocaine hydrochloride, but this did not produce any noticeable change in the temperature of the toes and the procedure was not repeated. The lower limbs were exposed to room temperature, but were neither elevated nor depressed. Reflex heating was maintained by continuous use of the electric blanket around the trunk. Anticoagulant therapy was instituted soon after the operation and was maintained for 8 days, commencing with 10,000 units of intravenous heparin and continuing with 5,000 units 6-hourly. This did not result in haematoma formation in the operation wound.

Papaverin (½ gr. 4-hourly) and Cyclospasmol (60 mg. 6-hourly) were used for their vasodilator effect; however, they were discontinued after 24 hours, since they produce a general vasodilator effect, not a local one; and there is doubt whether harm is not done by their use.[2]

The patient was heavily sedated and penicillin was given in full doses.

Progress

During the first 3 post-operative days the feet and the lower quarter of the legs remained cold and pallid and in grave danger of gangrene. The patient complained of pain in the right calf, which was tense and swollen. There was also oedema at both ankles. Soon, however, this oedema began to disappear and by the 5th day warmth commenced to return first to the legs and ankles and later to the feet and toes, warmth returning to the left foot before the right.

Ten days after operation our patient became dyspnoeic. The pulse was rapid and irregular owing to multiple extrasystoles (proved by electrocardiograph), the jugular venous pressure was raised and the liver was enlarged to 2 fingers below the costal margin. The patient was treated for congestive cardiac failure, though its etiology was not established, and made a satisfactory response.

In the meanwhile the circulation in the lower limbs improved steadily and with this improvement there was a gradual if slow return of motor power.

Examination at the beginning of December revealed warmth in both feet, good pulsation in the dorsalis pedis and posterior tibial arteries of both feet, and normal sensation except in the soles of the feet, which were hyperaesthetic and remained so for a further month, causing the patient considerable discomfort while he was learning to walk again. He was discharged from hospital in this condition on 8 December on maintenance therapy of digitalis for his cardiac condition.

In February 1955 the patient was perfectly well. The residual hyperaesthesia had completely disappeared and there was no claudication; in fact the only residual sign of the patient's recent experience of aortic embolism was a 10-inch laparotomy scar.

COMMENTS

This case is of considerable interest in that, following an embolectomy at the aortic bifurcation performed some 10 hours after the embolic incident, a complete recovery was made by the patient. It would appear, therefore, that in this case, 'the arbitrary period of

6-8 hours, following which embolectomy is unlikely to be successful' did not apply, and we should be encouraged in cases where a period of 10 or 12 hours or even longer has elapsed. Key and Murray[3] have reported success in a case operated on as long as 23 hours after the occurrence of the embolus. It is well to bear in mind, however, that embolism at the aortic bifurcation has been treated conservatively with success,[4] and it is possible that conservative treatment might have resulted in similar success in our case.

Immediate operation is nevertheless the standard treatment recommended by most, and temporizing and conservative treatment are only considered when the general condition of the patient is so bad as to preclude operation. In these cases sympathetic block, heparin, reflex heating and sedation are applied.[7]

As regards the source of the embolus, the commonest origin is from the left side of the heart in chronic rheumatic heart-disease and auricular fibrillation, and from mural thrombi at the site of a myocardial infarction or from thrombi within the auricle of a 'congested heart'. In our case there was no evidence of cardiac disease on admission and it was then postulated that a plaque of atheroma in the proximal aorta, was the site of thrombosis from which an embolus was dislodged. As our patient later developed congestive cardiac failure the significance of an earlier episode of exertional dyspnoea was realized. It is now concluded that the patient suffered from one of the types of 'idiopathic' heart failure which are seen from time to time in the non-European and that the embolus in fact had its origin in the left side of the heart.

Ian Aird's criterion of success following embolectomy is the immediate reappearance of pulses below the level of the block.[5] This would provide conclusive evidence of the 'mechanical efficiency' of the operation. In saddle embolus of the aorta, however, as the distal pulses may take hours, days or weeks to reappear, then on Aird's criteria very few cases have been successful. Only 2 cases are recorded as having survived for 5 years, and the majority are dead within 2 years. Cardiac disease and further emboli to vital centres take their toll. As far as limb survival is concerned, few cases escape without some loss of tissue due to ischaemic gangrene, and most require a major limb amputation on one or both lower extremities.

Sympathectomy and Sympathetic Block. It is important to remember that sympathectomy and sympathetic block may be extremely dangerous if applied to the ischaemic limb of acute onset, where massive gangrene may be precipitated by the procedure.[2] It has been shown[8] that after sympathectomy a fall takes place in the local blood pressure in the vessels distal to the block, and this will favour clot extension. Moreover, it is suggested that the opening of arterio-venous shunts by sympathectomy drains the superficial capillary tree and may promote superficial gangrene. Furthermore, for anatomical reasons extirpation of the lumbar sympathetic chain would hardly suffice to produce a vasodilation of collaterals by-passing the lower abdominal aorta and common iliac vessels, for there is a sympathetic contribution to these vessels from a higher level. It is concluded that benefit by sympathectomy is far more likely if performed several months after the acute onset of limb ischaemia, by which time the collateral circulation will have developed and will be further stimulated.

Anticoagulants. It is widely accepted that anticoagulant drugs are of benefit in thromb-embolic phenomena in that they reduce to a minimum clotting proximal and distal to the site of the embolism. There are, however, some important points to be made:

1. Haemorrhage may occur from the exploration wound and, more seriously, from the deep-seated arteriotomy wound.[9]

2. If the patient is being treated with anticoagulants then sympathetic block is extremely hazardous, for the danger of producing an extensive and even fatal retroperitoneal haematoma is considerable.

3. If operation is contemplated the effects of anticoagulants should first be counteracted by the use of protamine sulphate in the case of heparin, or by the use of vitamin K1 and blood transfusion in the case of synthetic anticoagulants.

Vasodilator Drugs. These all cause a general vasodilatation and are therefore unlikely to produce a maximal effect at the ischaemic area. Papaverin is only of use when applied locally to the blocked vessel at the time of the operation.[1] Other vasodilator drugs, particularly the ganglion blocking agents, have been variously recommended. They produce a general action, not a local one, and the same considerations apply to them as were discussed under sympathectomy.

General Management. The cardiac condition must obviously be investigated and the necessary treatment carried out. Blood pressure must be maintained, because fall in blood pressure will result in collapse of distal vessels and distal thrombosis. Kinmonth[1] has shown that vessels in spasm will not dilate in the presence of lowered blood pressure.

The limbs are kept exposed to cool air in order to reduce tissue metabolism. Most authorities recommend slight depression of the limbs in order to reduce the rate of the returning blood-flow so that complete dissociation of oxygen is assured. It is important to protect the ischaemic limb from trauma, whether of a mechanical or thermal nature, and ambulation is prohibited until the circulation is again adequate.[10]

SUMMARY

A case of saddle embolism of the aorta is described. The paucity of cases treated successfully is noted. An embolectomy performed 10 hours after the onset of symptoms was successful in our case. The relevant literature regarding the condition is briefly reviewed.

We should like to express our thanks to Dr. J. Allen, Superintendent of Baragwanath Hospital, and to Dr. H. Grusin, under whom the patient was admitted, for permission to publish this case report.

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OSTEOPOIKILOSIS

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Osteopoikilosis is a symptomless condition in which small areas of dense spongy bone are scattered within the cancellous portions of the skeleton. It was first described in 1905 by A. Stieda (quoted by Fairbanks[1]). The bone deposits may be spotted or streaky or both, and tend to occur at the metaphyses of long bones, particularly in the region of the hips. A definite association has been found with only one other condition, dermatofibrosis lenticularis disseminata (Lindbom,[4] Pillmore[5]). No biochemical abnormalities are described. More cases are said to occur in males than in females; familial occurrence was described by Holly.[3] The pathology has been described in only one case, by Schmorl,[6] who recorded the post-mortem findings in a boy of 14 years in whom the radiological diagnosis of osteopoikilosis had been made during life. Lesions were present in all the bones of the skeleton with the exception of the skull and clavicles, and in addition the patient showed evidence of pyonephrosis and amyloidosis.

The following is a summary of Schmorl's description of the bone lesions: The areas appeared as increased bone densities on X-ray, varying from a needle-head to a peppercorn in size, and were seldom larger than this. They were irregular, poorly circumscribed, round to oval in shape, and had a greyish-white homogeneous cut surface. The lesions never occurred in contact with the epiphyseal lines and were found in the diaphysis in the peripheral layers of the spongiosa, attached to the thinned out cortex, rather than in the more central portions of the spongy layer. On microscopical examination these lesions were seen to consist of closely-arranged bony trabeculae, the general appearance suggesting dense spongiosa rather than compact cortical bone. The trabeculae varied greatly in thickness, the thicker ones consisting of lamellar bone arranged for the most part parallel to the long axis of the bone in which the lesions occurred, and traversed by numerous fine cement lines. The thinner trabeculae had a less regular arrangement and often formed a network in the central portion of the lesions. The merging of the lesions with the surrounding spongiosa was gradual and sharply defined margins could never be seen. Typical Haversian systems were not a feature, and the spaces surrounded by the central network of trabeculae consisted of delicately arranged fibrous tissue with few cells, and sometimes containing capillaries, but never larger vessels. The osteocytes of the bony trabeculae were small and regularly arranged, but osteoclasts and osteoblasts were infrequent.

As in the other cases described, the diagnosis in the present case was made after radiography for another possible condition and was thus arrived at by accident. There was nothing in the history or examination to indicate that the lesion was present, and it has no significance in the main disease with which the patient presented. Dr. Leslie Werbeloff (personal communication) informs us that, to his knowledge, there are no X-ray plates of this condition in the records of the Groote Schuur Hospital. As the pathology has only been reported once before, this case is presented.

CASE REPORT

A Coloured male, 34 years of age, was admitted to the Somerset Hospital, Cape Town, on 21 January 1955, with a 3-week story of diarrhoea, with subsequent rawness of the mouth, sore feet and weakness. Typical signs of pellagra were present on the face and feet, but the skin of the arms was only slightly thickened. The packed cell volume was 43%, the erythrocyte-sedimentation rate 38 mm. in the first hour (Westegren), and the remainder of the blood examination was normal. There were no abnormal findings in the urine. On examination of the stool, by direct and cultural means, no amoebae, salmonellae or shigellae, or other intestinal pathogens were demonstrated. The serum proteins were: albumin —4·2 g.%, globulin —2·5 g.%; the serum calcium was 9·9 g.%, and the blood Berger and Wassermann reactions were negative.

It appeared that the patient had suffered 3 other attacks of pellagra in the past few years, receiving treatment at the Victoria Hospital, Wynberg. His was a grossly deficient diet, and his intake of alcohol was chronically excessive. There was no history of trauma to the legs.

He had a severe stomatitis with gingivitis. In order to exclude additional scurvy, the tibiae were X-rayed (Figs. 1 and 2). It will be seen that within the distal portions of both tibiae are streaky and spotted calcifications; the normal trabeculation is well preserved. There is no periosteal elevation to suggest scurvy. A full radiographic survey made of the skull, vertebrae, pelvis, hands, feet and other long bones showed no abnormalities.

The pellagra responded rapidly to daily intramuscular injections of vitamin-B complex, mouth-washes, and soaks to the feet.

On 16 February Dr. Alex Singer performed a biopsy on the lower end of the right tibia. The patient agreed to this procedure knowing that it was for academic purposes.

Pathological Findings

The specimen received consisted of a disc-shaped piece of bone approximately 0·8 cm. thick and 1·6 cm. in diameter. The naked-eye appearances were those of fairly dense spongy bone. After formalin fixation, nitric acid decalcification and paraffin embedding, sections were cut and stained with haematoxylin and eosin.

Fig. 1.

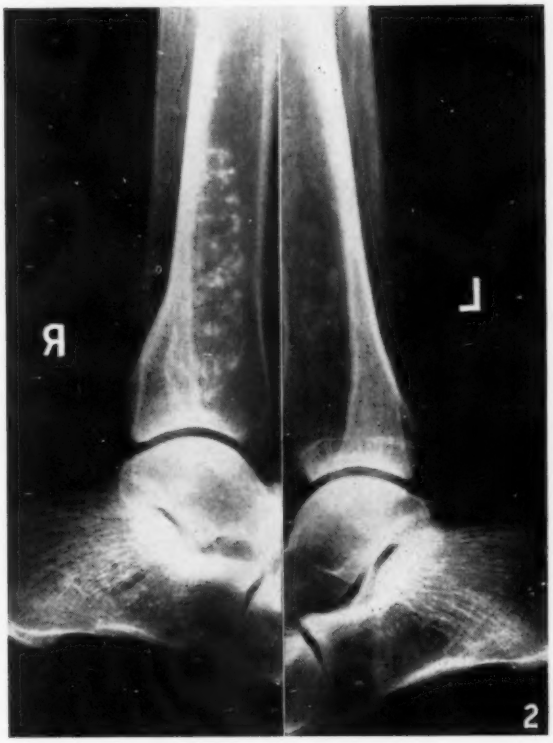

Fig. 2.

On histological examination (Figs. 3 and 4) the lesion was seen to have a structure resembling dense spongy bone. It was composed of thick heavy trabeculae of lamellar bone, having a fairly regular arrangement but without typical Haversian systems. The spaces surrounded by the trabeculae were large and irregular and showed a marked variation in size. These spaces were traversed by delicate fibrous strands, were acellular, and, while large blood vessels were not seen within them, small capillaries were not infrequent. The osteocytes were numerous and regularly arranged, but osteoclasts were not seen.

Under the polarizing microscope the doubly refractile collagen of the trabeculae was seen to occur as irregular, thick bands bearing no constant relationship to the spaces in the bone. This appearance is in striking contrast to that seen in a section of normal tibia from the same site, where the collagen can be seen

Fig. 3. Low power view of the lesion approx. ×60.

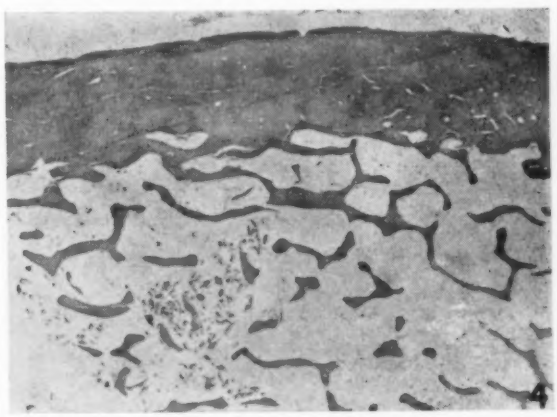

Fig. 4. Section of normal control from the same anatomical site, same magnification, showing normal cortical bone (top) and spongy bone (bottom).

to be arranged concentrically around the Haversian canals. This appearance was confirmed in van Gieson-stained sections, and provides confirmation, if any is needed, of our impression from the H and E sections that the structure is not that of compact bone.

These features closely resemble those described by Schmorl[6] in the case quoted.

DISCUSSION

The radiographic diagnosis of osteopoikilosis in this case is not difficult. The preservation of trabeculation excludes bone infarcts and enchondromata or osteomata. The mixture of spotted and linear densities and the localized sites exclude osteopathia striata, where all bones except the skull and clavicles are affected by striations extending well into the shaft. In melorheostosis the shafts of the long bones are involved (and widened—Hall[2]) by bands of dense bone and the lesion never consists of dots and stripes. Fairbanks[1] does not see any resemblance between dyschondroplasia and osteopoikilosis.

One cannot attempt to draw conclusions about the nature of the pathological process or its pathogenesis on the basis of a single biopsy from one lesion. Schmorl,[6] after a complete post-mortem examination of a case with disseminated lesions was unable to come to a definite conclusion. He felt that the lesions most probably arose from the fibrous tissue of bone marrow, but did not consider that there was sufficient evidence to label them osteomata. An endochondral origin was considered unlikely in view of the fact that the lesions were never demonstrated in connection with the endochondral growth zone, and that cartilage was never observed in any of the lesions studied.

Schmorl's conclusions were that the condition is a congenital one.

SUMMARY

The radiological and pathological features of a case of osteopoikilosis are described. To our knowledge this is the second case in which histological examination of the lesions has been performed.

We wish to thank Dr. A. Landau and Professor J. G. Thomson for permission to publish the case and for their helpful advice in the preparation of this paper. Mr. B. Todt kindly prepared the reproductions of the X-rays.

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ASSOCIATION NEWS : VERENIGINGSNUUS

AFDELING OVERBERG—TAK WES-KAAPLAND

Die eerste vergadering van die pasgevormde Afdeling, insluitende Caledon en omliggende dorpe, is gehou te Caledon op 25 November 1955 by die Algemene Hospitaal.

Teenwoordig was drs. H. F. Snyman, E. F. K. Behne en J. S. le Roux van Caledon; drs. F. D. du Toit, A. Myburg en R. P. van Heerden van Bredasdorp; drs. B. van Zyl en F. T. Mangold van Napier; drs. J. C. de Villiers en F. Malherbe van Swellendam; dr. H. L. Cohn van Hermanus; en dr. P. J. Burger van Greytown.

Die eregaste van die aand was professor en mev. R. J. Goetz van Kaapstad en dr. P. J. M. Retief, voorheen eresekretaris, Wes-Kaaplandse Tak van die Mediese Vereniging. Dr. Snyman, in die amp van sameroeper van die vergadering, het almal teenwoordig welkom geheet. Daarna is die notule gelees soos opgeteken gedurende die stigtingsvergadering.

As 'n mosie van roubeklag weens die heengaan van dr. M. Cole Rous, het die vergadering enkele oomblikke in stilte gestaan.

Dr. Snyman het toe vir prof. Goetz bedank vir die eer wat hy die nuwe Afdeling bewys het deur hul te kom toespreek.

Prof. R. J. Goetz het 'n mees interessante praatjie gelewer oor sy ekspedisie na die noord-oostelike Transvaal, waar hy en sy kollegas verskeie interessante toetse uitgevoer het op lewende sowel as dooie kameelperde om die bloedsisteem te ondersoek en te probeer vasstel watter meganisme verantwoordelik is vir die regulering van die bloeddruk. Wanneer die kameelperd sy kop van 'n drinkende posisie optel tot 'n hoogte van 20 voet, is daar geen teken van duiseligheid as gevolg van die verandering van bloeddruk nie. Die praatjie is geïllustreer met 'n kleurfilm wat nie net pragtige natuurtonele bevat het nie, maar ook gewys het hoedat die eksperimente in werklikheid uitgevoer is. Die vergadering het prof. Goetz se praatjie baie interessant gevind en hom by wyse van handegeklap bedank.

Naam vir die nuwe Afdeling. Dr. Snyman het toe gemeld dat die gebied wat die Afdeling behels histories bekend is as Overberg. Dr. Mangold se voorstel dat die Afdeling Overberg sal heet is gesekondeer deur dr. Van Zyl en aangeneem deur die vergadering.

Die eerste komitee is toe gekies: *Voorsitter*—Dr. H. F. Snyman; *Ondervoorsitter*—Dr. A. Myburg; *Sekretaris en Penningmeester*—Dr. J. S. le Roux; *Komiteelede*—Drs. B. van Zyl, H. L. Cohn en P. J. Burger.

Grense. Die nuwe komitee is toe gevra om die grense van die nuwe Afdeling vas te stel. Dit is besluit om 'n brief te rig aan die Afdeling Worcester en om hulle opinie te vra oor die insluiting van Swellendam by die Afdeling Overberg.

SOUTHERN TRANSVAAL AND EAST RAND BRANCHES

MUTUAL MEDICAL AID SOCIETY OF 1954

Members of these Branches are again notified that this body has not received recognition from the Medical Association as a Medical Aid Society. Accounts must therefore be rendered to patients in a private capacity, and the usual private fees should be charged. It is important that members should not complete any forms or submit any other information for this Society, or communicate with them in any way in reference to any liability incurred by one of the members of the Society.

Members are advised to ignore any communication in the Press or any direct or indirect communication from this Society.

Any queries should be directed to the office of the Medical Association.

NATIONAL MEDICAL AID SOCIETY

Members are again reminded that official recognition of this Medical Aid Society has been withdrawn as from 1 January 1956. Accounts must therefore be rendered direct to the patients, who will be charged private fees. Members should not communicate with the Society in reference to any liabilities which may be incurred after 1 January 1956. Any queries may be directed to the office of the Medical Association.

Items have appeared in the newspapers regarding the attitude of the Association towards Medical Aid Societies. Members are asked not to give any credence to interviews with alleged representatives of the Medical Association, and to refrain from giving information to the Press which might be considered as emanating from official sources.

A. L. Agranat
Chairman, Joint Contract Practice Committee
24 December 1955 *Southern Transvaal and East Rand Branches*

RECENT ACCESSIONS TO THE MEDICAL LIBRARY, UNIVERSITY OF THE WITWATERSRAND

Bowes, R. K. Modern trends in obstetrics and gynaecology. 2nd series. London. Butterworth. 1955.

Boyd, W. Pathology for the surgeon. 7th ed. Philadelphia. Saunders. 1955.

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UNION DEPARTMENT OF HEALTH BULLETINS

Union Department of Health Bulletin. Report for the 6 days ended Wednesday, 14 December 1955.

Plague, Typhus Fever: Nil.

Smallpox. Cape Province: Four (4) European cases in the Cape Town municipal area.

One (1) Coloured case in the Beaufort West district.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Chalna, Dacca (Pakistan).

Smallpox in Rangoon (Burma); Phnom-Penh (Cambodia); Ahmedabad (India); Dacca, Lahore (Pakistan).

Typhus Fever in Baghdad (Iraq); Cairo (Egypt).

Report for the 6 days ended Tuesday, 20 December 1955.

Plague. Cape Province. No further cases have been reported from the Uitenhage Divisional Council Area since the notification in the bulletin of 25 November 1955. This area is now regarded as free from infection.

Smallpox, Typhus Fever: Nil.

Epidemic Diseases in Other Countries.

Plague: Nil.

Cholera in Chalna, Dacca (Pakistan).

Smallpox in Herat, Kabul, Kandahar (Afghanistan); Rangoon (Burma); Phnom-Penh (Cambodia); Ahmedabad, Allahabad, Delhi (India); Dacca, Lahore (Pakistan).

Typhus Fever in Cairo (Egypt).

BOOK REVIEWS : BOEKRESENSIES

OBSTETRIC DIFFICULTIES

The Management of Obstetric Difficulties. Fifth edition. By Paul Titus and J. Robert Willson, M.D., M.S. Pp. 737, with 348 illustrations. £5 6s. 3d. St Louis: The C. V. Mosby Company. 1955.

Contents: 1. The Causative Factors in Infertility and their Detection. 2. Treatment of Infertility. 3. The Diagnosis and Duration of Pregnancy. 4. Prenatal Care and Minor Complications of Pregnancy. 5. Anomalies and Diseases of the Generative Tract During Pregnancy. 6. General Surgical Conditions during Pregnancy. 7. Infectious Diseases, Skin Diseases and Disorders of the Nervous System during Pregnancy. 8. Diseases of the Urinary System during Pregnancy. 9. Diseases of the Heart and Bloodforming Organs, the Gastrointestinal Tract, and the Endocrine Organs during Pregnancy. 10. Abnormalities and Diseases of the Placenta and the Fetal Membranes. 11. Abortion and Premature Labour. 12. Ectopic Pregnancy. 13. Bleeding during late Pregnancy. 14. Multiple Pregnancy. 15. Toxemia of Pregnancy. 16. Normal Labour. 17. Dystocia from Anomalies of Uterine Contractile Forces. 18. Dystocia from Developmental Anomalies and Gynecologic Abnormalities. 19. Pelvimetry and the Recognition of Contracted Pelvis. 20. Dystocia from Contracted Pelvis. 21. Dystocia due to Fetal Complications. 22. Postpartum Hemorrhage and Complications of the Third Stage of Labor. 23. Injuries to Birth Passages and Adjacent Organs. 24. Induction of Abortion, Sterilization and Induction of Labor. 25. Breech Delivery—Breech Extraction—

Version and Extraction. 26. Forceps Delivery. 27. Cesarean Section. 28. Mutilating Operations of the Fetus (Embryotomy). 29. The Normal Puerperium Postpartum Care and the Management of Postpartum Complications. 30. Puerperal Infection. 31. Obstetric Analgesia and Anesthesia. 32. Preparation for Obstetric Operations. 33. Special Examinations and Treatment. 34. Care of the Infant during Labor and at Delivery. 35. The Newborn Infant.

This book was first written by Paul Titus in 1937, and was intended to be a guide to the general practitioner. A basic knowledge of the normal in pregnancy and labour was assumed and only the deviations from normal discussed. Since 1937 the text has been revised 4 times. This was made necessary by the rapid development of medical knowledge in the last 15 years. The 5th edition has been very extensively revised and partially re-written by Robert Willson. He has departed slightly from the original by introducing chapters on normal pregnancy and labour, thus bringing it more into line with standard text-books on the subject. The general lay-out of the book remains the same and the excellent feature of including references for further reading at the end of each chapter has been retained. These have been revised and brought up to date.

The extra-genital complications of pregnancy are discussed in 4 chapters. The surgical complications are briefly dealt with, and the emphasis is on treatment of the underlying condition without regard to the pregnancy. The problem of malignancy in the breast and bowel is discussed by the management of carcinoma of the cervix in pregnancy is not mentioned. This, I feel, is a serious omission.

In the chapter on haemorrhages in pregnancy considerable attention is paid to the diagnosis of placenta praevia by radiography, and several excellent X-rays illustrate the text. While the management of complete placenta praevia is fairly straightforward the author advocates Caesarean Section for the incomplete varieties in primigravidae and in some multigravidae.

The aetiology of abruptio placentae is superficially discussed and the condition of afibrinogenaemia stressed. It is emphasized that before treatment is started blood should be taken in a test-tube to test for a clotting defect. Adequate blood replacement and the administration of fibrinogen if required are the principles of the successful treatment of the severe case. The management of the third stage of labour is dealt with in the same chapter as the treatment of post-partum haemorrhage. Emphasis is placed on the danger of the small trickle of blood which may be ignored until the patient's condition has deteriorated.

In the same way the normal puerperium is discussed in the same chapter as its complications. The importance of treating cervical erosions is stressed. The chapter on the newborn infant includes the latest ideas on the diabetic and Rh infant and is particularly valuable.

The material in this book complements that found in the standard text-book and should be of value to anyone interested in the practice of obstetrics. It is unfortunate that the book is so highly priced as to be beyond the reach of the average student's pocket.

D.M.

OBSTETRICS

Obstetrics. Eleventh edition. By J. P. Greenhill, M.D. Pp. 1088 + viii, with 910 illustrations. $14.00 Philadelphia and London: W. B. Saunders Company. 1955.

Contents: Part I. The Physiology of Reproduction, Pregnancy, Labor and the Puerperium. 1. Physiology and Conduct of Pregnancy. 2. Physiology and Conduct of Labor. 3. Physiology and Conduct of the Puerperium. *Part II. The Pathology of Pregnancy, Labor and the Puerperium.* 4. The Pathology of Pregnancy. 5. Pathology of Labor: Introduction. 6. Pathology of the Puerperium. 7. Operative Obstetrics. Index.

The 11th edition of this American text-book of obstetrics is again welcomed as one of the foremost works in this sphere. From 1913 to 1938 this book passed through 7 editions under the authorship of that great master of obstetrics, Joseph Bolivar de Lee. After de Lee's death in 1942 the task of authorship fell on the master's disciple, J. P. Greenhill, and the next 3 editions were inscribed under the joint authorship of de Lee-Greenhill. This latest edition is now for the first time inscribed under the sole authorship of Greenhill, although as in previous editions he has not hesitated to enlist the aid and advice of experts in varying branches of medicine.

W. B. Saunders Company has devised an attractive new cover for the book and the title has been changed from the old *Principles and Practice of Obstetrics* to *Obstetrics*. The quality of the printing and the paper is as high as before and special mention should be made of the superb illustrations, of which no less than 125 are new.

The striking feature about this work is that it is probably the most up-to-date obstetrical text-book today. This is not surprising if one remembers that the author is also the editor of *The Year Book of Obstetrics and Gynaecology*. This is further borne out in the manner in which the author draws upon world-wide experience in obstetrics without letting the book lose its essential American character. In the well arranged reference sections numerous articles of 1954 publication as well as a few of 1955 publication are quoted. This in a book that was published in the first half of 1955 is indeed a commendable achievement!

It is gratifying to see that the importance of the coagulation defect in the blood in certain cases of concealed accidental haemorrhage, amniotic fluid embolism, and the dead foetus syndrome, is stressed. This is particularly apt because de Lee first drew attention to this condition in 1901, when he described it as a 'temporary haemophilia'. The recommendation that 10 g. of fibrinogen sufficient to treat one patient adequately, should be available in every hospital where obstetrics is practised, is timely, although unfortunately for us in South Africa probably impractical—the price of that quantity of fibrinogen is likely to be in the region of £90.

Due recognition of rupture of the placental marginal sinus as a cause for antepartum haemorrhage is given. The classification of the 3 ways in which a breech presentation may be delivered vaginally, viz., spontaneous breech delivery, partial breech extraction and total breech extraction, is sensible. It is a pity that the beautiful illustrations depicting Thorn's manoeuvre for the conversion of a face or a brow presentation to a vertex presentation have been deleted from this edition. No mention of the Blond-Heidler decapitation thimble and saw for use in destructive operations is made. This instrument seems to be preferable to the Jardine's hook.

One cannot but recommend this book to all lovers of the art of obstetrics.

W.H.M.

THE PHARMACOLOGY OF TEA

Tea: A Symposium on the Pharmacology and the Physiologic and Psychologic Effects of Tea. By Henry J. Klaunberg, Ph.D. Editor. Pp. 63. Washington: The Biological Sciences Foundation, Ltd. 1955.

Contents: 1. Introduction. 2. Tea—its Pharmacology. 3. Beverage and Dietary Aspects of Tea. 4. A Medical Appraisal of Tea. 5. Tea for the Relief of Fatigue, Anxiety and Tension States. 6. Psychological Effects of Tea Drinking. 7. Effects of Tea on Gastric Secretions. 8. The Psychophysiological Effects of Tea.

Next to water tea is the most consumed beverage in the world. From the medical point of view there is a scarcity of knowledge and writings on the subject. From the scant evidence available it seems that tea is a relatively harmless beverage. At present there are no medical contra-indications to the drinking of tea: it can be imbibed freely in all obesity diets; there is no sodium in tea; it is not contra-indicated in gout or in hypertension. In fact there are many good reasons ('indications') for the widespread use of tea. Why tea should be so much favoured is difficult to prove; the beverage is more than an aqueous solution of caffeine and tannins. The tannin of tea is not the same as tannic acid, and tea caffeine is less effective than chemically pure caffeine: in other words, the known properties of caffeine and of tannins are not those of tea any more than the action of a digitalis glycoside is that of prepared digitalis (leaf). The constituents of tea are many and include the xanthines and tannins, fluorine, vitamins and amino acids.

Tea has been shown to increase the rate of gastric emptying. It has been shown, by psychological tests, to increase alertness and speed of discrimination. There are many unsolved problems.

Those who feel impelled to do research on tea must read this booklet, where the present status of tea from the pharmacological, physiological, psychological and clinical aspects is considered. Most readers will no doubt just sit back and enjoy a cup of tea.

N.S.

THE AUTONOMIC NERVOUS SYSTEM

Clinical Aspects of the Autonomic Nervous System. By L. A. Gillilan, Ph.D., M.D. Pp. 316 + xii, with 42 illustrations. 45s. London: J. & A. Churchill Ltd. 1955.

Contents: 1. Introduction. 2. The Cerebral Centers and the Autonomic Nervous System. 3. Anatomy of the Peripheral Autonomic System. 4. Central Autonomic Pathways. 5. Autonomic Innervation of Structures in the Head Region. 6. Visceral Sensation and Embryology of the Autonomic Nervous System. 7. The Cardiovascular System. 8. The Respiratory Tract. 9. Glands. 10. The Digestive System. 11. The Urogenital System. 12. Visceral Pain from the Abdomen and Pelvis. Bibliography. Index.

The title of this book is misleading. Of its two sections the first, dealing with formal anatomy, is the longer by several pages, and the second or clinical part contains many passages of pure neuroanatomy. The balance is thus tilted heavily in the anatomical direction, and while this may be taken as a recognition of the central importance of structure and arrangement in the study of the autonomic nervous system, the clinician will inevitably find the treatment of many problems, e.g. hypertension, somewhat scanty. In fact the book is an account of the anatomy and physiology of the autonomic nervous system with illustrative comment from clinical experience.

The best section of the book is that dealing with autonomic structures in the central nervous system, a field in which much progress has been made in the last few years—progress which is fairly summarized by the author. American authors are occasionally strangely neglectful of European sources, but no such accusation of bias can be made against Prof. Gillilan, who presents the contributions of not only British, but also French, German and other European workers in the field.

It is sometimes felt to be ungracious of a reviewer to bring up small points of criticism. Authors and publishers ought to welcome suggestions and corrections as evidence of real interest, even if they do not feel inclined to follow the advice given. The line drawings which illustrate the text are successful, some three-dimensional illustrations of the brain-stem being particularly effective. The numbering of these diagrams, however, is on a plan—new and irritating to me—whereby when a figure is, quite justifiably, repeated, it is given its old number. Thus we find Fig. 4 sandwiched between Figs. 36 and 37. All that is necessary is to state in the list of Figures that Fig. 37 repeats Fig. 4. Terminology is an old bone of contention, and one can only hope that the new agreed Nomina Anatomica, approved and adopted by the 6th International Congress of Anatomists in Paris in July 1955, will help to promote uniform nomenclature and so improve international understanding. One particular blemish is the misspelling ileoinguinal nerve (pp. 253, 256 and index). And, lastly, the book comes to an extraordinarily lame ending, almost as if some pages were lost by mistake, although the pagination gives the lie to this suggestion. To end a book with a quotation from another author on a point of detail creates an impression of casualness which is not a just reflection of the book as a whole.

E.N.K.

CORRESPONDENCE : BRIEWERUBRIEK

DIVERSION CALL TELEPHONE CHARGES

To the Editor: May I bring to your notice an unfortunate alteration in diversion call charges by the Post Office? I quote from an official communication I have received:

'Subscribers who ask for a series of diversions of 24 hours *or less* (italics mine) duration, e.g. from 12 noon to 2 p.m. daily over a period of days or weeks, are warned that a fee of 5s. 0d. will be charged for every occasion. . . . . For periods of diversion up to 24 hours: 5s. 0d. per occasion. . . . .'

This is an intended regime which I feel should be energetically combated by the practitioners' representative body, viz. the Medical Association.

Country doctors on numerous occasions (for example when expecting maternity calls) ask the exchange to put calls through to the outlying number wherever they are attending. I have personally had to do this 4 times in one day. It is easy to see the expenses that will be incurred by the doctor merely in order to keep in touch with an impending emergency. I doubt whether any doctor would employ the alternative, viz. to wait until he returns to the surgery, merely because of expense. This will therefore mean large telephone bills monthly, which will have to be carried entirely by the medical and veterinary professions.

I am sure the Post Office has omitted to consider this aspect and I hope our Association will make every effort to put the matter in its proper perspective.

T. H. Crouch

Mooi River
15 December 1955

SURGEON AND ANAESTHETIST

To the Editor: We found the letter of Dr. Willem P. Steenkamp, Jnr.[1] most interesting. The picture Dr. Steenkamp presents of a patient 'fighting for his life and straining his abdominal muscles in the process' (one which is not unfamiliar to ourselves) is usually incomplete without the anxious and somewhat guilty face of the surgeon peering over the left shoulder of the harassed anaesthetist, entrusted simultaneously with the patient's life and the surgeon's reputation. The ministrations of the 'super-specialist' in such circumstances are not infrequently beneficial. Indeed on one occasion I was actually thanked by the surgeon, in the presence of the theatre sister, and this incident can be vouched for.

We regularly employ the technique to which Dr. Steenkamp probably refers, and find that such resuscitation as is necessary is dependant on the degree of surgical trauma inflicted.

Perhaps the Lord has also been kind to our patients, for indeed 'where the need is greatest there shall I be'.

Super-Specialist

13 December 1955

1. Steenkamp, Willem P., Jnr. (1955): S. Afr. Med. J., **29,** 1156.

THE ORIGIN OF VACCINATION

To the Editor: In the Week-end *Argus* of 17 December 1955 there was an article by 'G.P.' stating that inoculation with cowpox was first performed by Edward Jenner in 1796. This seems to be the generally accepted theory—but is he not aware that it was successfully done 22 years earlier by Benjamin Jesty?

Jesty's grave may be seen in the churchyard at Worth Matravers, Dorset, and the headstone states this fact.

I am on holiday at the moment, but at home I have a paper cutting from *The Times* as witness of this—and I shall be pleased to let you or him see it if either is interested.

Honor Darroll

Hounstout
Orchard Street
Newlands, Cape
21 December 1955

THOMAS BENJAMIN DAVIE

To the Editor: May I, as one of Dr. Davie's students, pay tribute to the passing of a great man.

Much has been said about his work as an administrator and as the Principal of the University of Cape Town, but I remember him best as the Professor of Pathology in the University of Liverpool 18 years ago.

His virile personality and succint clear and lucid style made him the most sought-after and popular lecturer in the University at that time.

On Saturday mornings he ran a famous class for undergraduates and postgraduates alike, in which the clinicians of the city, together with the students of the University attended in large numbers; in fact, students came from as far away as Manchester and Leeds to be present and to hear him speak.

Many people felt that, when he gave up the teaching of Pathology to become the Principal of the University of Cape Town, it was a great loss to Medicine and particularly to the undergraduates, for they looked upon him as a pillar of strength and a resolver of difficulties; but what was a loss to Liverpool University was a gain for Cape Town.

His death leaves a gap which it will be hard to fill. We mourn a kindly, able and sincere man.

T. B. McMurray

Union House
Queen Victoria Street
Cape Town

20 December 1955

RADIOTHERAPY IN CANCER OF THE BLADDER

To the Editor: In a recent article in the *Journal* on 'the Role of Radiotherapy in the Treatment of Malignant Disease' Mr. Ralston Paterson[1] presents certain data on the results of radiotherapy in the treatment of cancer of the bladder, which I cannot allow to go unchallenged.

It is my contention that the figures quoted in this article are useless as a means of evaluating the results of radiotherapy in the treatment of bladder cancer. It has been clearly shown by Jewett[2] tnat any data on the treatment of carcinoma are meaningless if the investigator relies only on a cystoscopic and/or histological diagnosis, and that the results of therapy are dependent, almost entirely, upon the depth to which the tumour has spread through the bladder wall, as determined by adequate transurethral biopsy and bimanual examination under anaesthetic. On this basis he has shown that where, a tumour has not extended more than half way through the bladder muscle, *irrespective of what situation it occupies in the bladder*, partial cystectomy results in a 5-year cure rate of more than 80%, *without evidence of recurrence.*

This method of pre-operative evaluation of the tumour is, unfortunately, not yet widely practised in Great Britain. Until Mr. Ralston Paterson can present his data along the lines put forward by Jewett I, for one, shall be unable to draw any valid conclusions from the figures he has presented in his article.

J. N. de Klerk

623/4 Groote Kerk Buildings
Adderley Street
Cape Town

23 December 1955

1. Paterson, R. (1955): S. Afr. Med. J., **29**, 1215 (24 December).
2. Jewett, H. J. and Cason, J. F. (1948): Southern Med. J., **41**, 158.

MEDICAL ETHICS AND ADVERTISING

To the Editor: The letter from Dr. J. B. Lurie[1] on this subject is of interest to all of us. Your note which follows adds concern.

Just how is it 'contrary to the tradition of the profession' for a doctor to receive the acclaim of his fellow citizens in a field having to relationship to medicine? Surely the fact that he proves nimself a capable author has no bearing on his professional life. The practitioner in question chose to use a nom-de-plume. Why should he feel obliged even to do this?

How would our Medical Council react to the case of Dr. Roger Banister? Should he have run his record-breaking mile under a nom-de-plume, or not at all, lest he break with professional tradition?

What is meant by the phrase 'take cognizance of'? It has an ominous ring—as if one had incurred the displeasure of the headmaster.

I imagine that we, as a profession, might well take cognizance of the fact that a colleague had excelled elsewhere than in his own field. We might be proud of it. But no, he must be hidden away behind a cloak of anonymity, lest he gain advantage over the rest of us by this so-called advertising.

Finally, I would ask whether there are among us those who would be so small-minded as to complain to the Council on such a matter; surely not.

S. C. Appleton

Vadas Building
42 Strand Street
Cape Town

21 December 1955

1. Lurie, J. B. (1955): S. Afr. Med. J., **29**, 1212 (17 December).

MEDICAL STATISTICS

To the Editor: It is perhaps ironic that the survey on toxoplasmin skin tests[1] should appear in the same issue of the *Journal* as Dr. G. R. Crawshaw's letter with its opening broadside.[2] I would like to add my small voice to those already crying out against the abuse and misuse of figures, for Drs. Schneider, Goddard and Heinz have offended against the canons of statistics and this has led them to at least one very wrong assumption.

We are not told how the 209 patients were selected, apart from the fact that they were in hospital and *ipso facto* not healthy. Were any or many of these patients ill with toxoplasmosis or infected with an organism 'with a similar antigenic structure'? Did the doctors descend upon whole wards at one fell swoop or were tests done at the investigators' whim? Because of the uncertainty of the characteristics of the group, doubt must fall on every deduction the authors may draw. They may be right, but they haven't started to show it.

No control injections seem to have been given, in the manner that one does when testing, for example, with anticercarial injection. This may not be necessary for all I know, but I should like to be reassured on this point.

Table I contains figures and a facile translation of proportions into percentages, to the third significant figure. This third figure, considered in relation to the size of the sample has no meaning. The authors have added insult to injury by getting their arithmetic wrong in 2 of the 6 percentages that they have worked out—a trifling error in the first decimal place, perhaps, but an avoidable one. The authors, indeed, have used the word 'percentage' instead of 'proportion' throughout.

Because the 'percentage' in the age-group 50-81 is '37·7' and those in the groups 30-39 and 40-49 are '43·5' and '42·9' (corrected figures) an assumption is made to account for the 'falling off' and there is a naïve comment that this does not tally with findings of other workers. Five minutes work with a log book would show that if age had no effect in the groups under discussion the result obtained by the authors would be found by pure chance in a little more than half of such trials. It is, thus, slightly more likely to find such 'percentages' than to call the toss of a coin correctly, and the assumptions made are groundless, as yet. They *may* be correct, and a properly planned trial may provide some evidence, for or against.

There are many other minor faults in this short article. No mention is made of any principle of selection for the more valuable diagnostic aid, the Sabin-Feldman dye test, nor what ailed the 9 with the positive titre of 1 : 64. Trichomonas is a very common beast, and he may indeed be responsible for all the positive tests. For all we know, every positive reactor may be female. We are not told otherwise. It is a pity the authors did not take to heart their own quotation about the proper control of studies as to age-grouping and residence. I cannot believe that the age-distribution given resembles at all the average distribution of Africans in Johannesburg.

Figures are thrown into articles ostensibly to illuminate, but in many cases they obscure. May I recommend to those intending to publish, and to those who fiddle about with the medical curriculum, the little black book of Dr. Bradford Hill.

H. David Friedberg

P.O. Box 123
Wankie, S. Rhodesia

16 December 1955

1. Schneider, J. *et al.* (1955): S. Afr. Med. J., **29**, 1162.
2. Crawshaw, G. R. (1955): *Ibid.*, **29**, 1184.
3. Hill, A. B. (1955): *Principles of Medical Statistics*, 4th ed. London: The Lancet Press.

South African Medical Journal
Suid-Afrikaanse Tydskrif vir Geneeskunde
P.O. Box 643, Cape Town Posbus 643, Kaapstad

Cape Town, 14 January 1956 Weekly 2s. 6d. | Vol. 30 No. 2 | Kaapstad, 14 Januarie 1956 Weekliks 2s. 6d.

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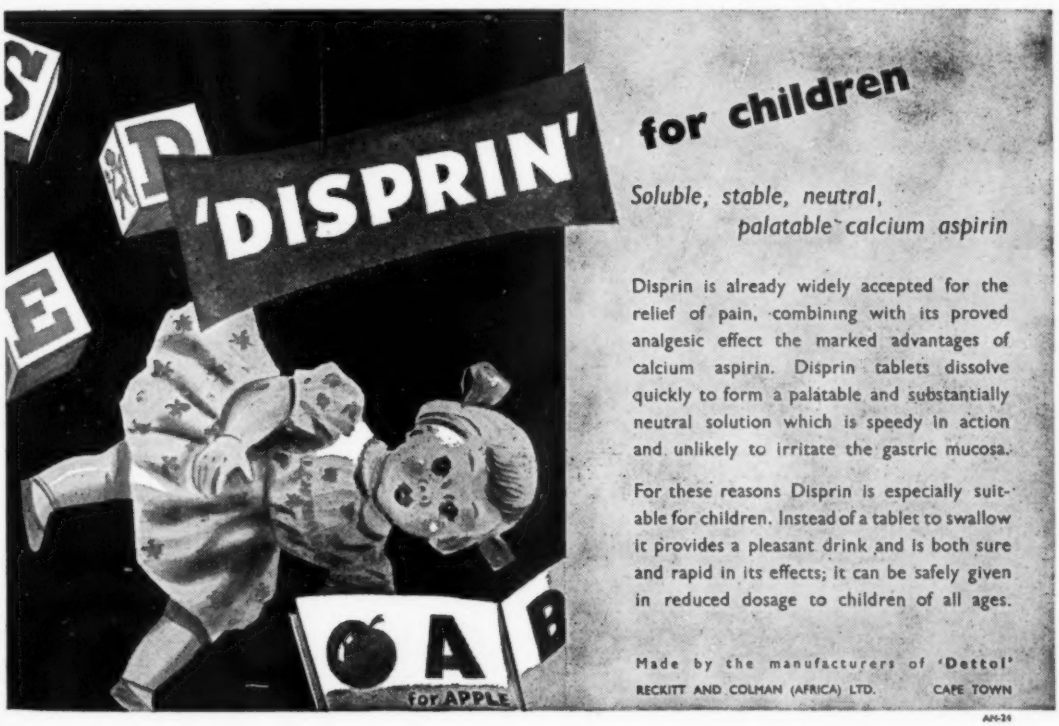
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